

Staff Summary Report



Council Meeting Date: 7/17/2003

Agenda Item Number: 51

SUBJECT: Request approval of the City of Tempe, Housing Improvement Program, Standards of Rehabilitation Manual.

DOCUMENT NAME: 20030717dsnw03

**SECTION 8 HOUSING ((0207-03)
RESOLUTION #2003.51**

SUPPORTING DOCS: Yes

COMMENTS: The Housing Services Division currently administers federally funded programs. These programs are the Community Development Block Grant (CDBG) Program and the Home Investment Partnerships (HOME) program. The city designates a portion of these funds for the conservation and enhancement of Tempe neighborhoods through residential rehabilitation and related public improvements.

The Standards of Rehabilitation Manual is produced to enhance communication between participants in the rehabilitation process and describes the policies for the administration of the Housing Improvement Program. The standards are adapted to the physical and regulatory conditions prevailing in the city of Tempe and serve basic program purposes: they are used as standards in the inspection and evaluation of conditions of residential properties to be considered for rehabilitation; they are part of the criteria for determining whether rehabilitation is feasible for individual residential properties; they serve as minimum standards to which individual residential properties shall be improved if rehabilitation is undertaken.

The Housing Services Division has revised the Manual, last passed by Council on February 18, 1999, due to changes in federal regulations and administrative policies.

PREPARED BY: Liz Chavez, Housing Services Supervisor; Housing (480-350-8958)

REVIEWED BY: Melanie Hobden, Development Services Manager (480-350-8069)

LEGAL REVIEW BY: Cliff Mattice, Assistant City Attorney (480-350-8610)

FISCAL NOTE: The Community Development Block Grant (CDBG) and Home Investment Partnership (HOME) Programs (federally funded) absorb all costs associated with this plan.

RECOMMENDATION: Approval of Resolution 2003.51.

ADDITIONAL INFO: None

RESOLUTION NO. 2003.51

**A RESOLUTION OF THE CITY COUNCIL OF
TEMPE, ARIZONA APPROVING THE CITY OF
TEMPE STANDARDS OF REHABILITATION
MANUAL.**

WHEREAS, the City of Tempe's Housing Services Division administers federally funded programs; Community Development Block Grant (CDBG) and Home Investment Partnerships (HOME) Programs; and

WHEREAS, the primary purpose of the City of Tempe CDBG/HOME programs is to further the goal of providing a decent house and suitable living environment to all citizens, and the preservation of older Tempe neighborhoods.

WHEREAS, the City of Tempe Housing Services Division has produced this Manual to enhance communication between participants in the rehabilitation process.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF TEMPE ARIZONA, as follows:

Section 1: The City of Tempe's revised Standards of Rehabilitation Manual is hereby approved and,

Section 2: The Housing Services Division is authorized and directed to submit the Revised Plan to the U.S. Department of Housing and Urban Development.

PASSED AND ADOPTED BY THE CITY COUNCIL OF THE CITY OF TEMPE, ARIZONA, this 17th day of July, 2003.

Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:

**CITY OF TEMPE
DEVELOPMENT SERVICES DEPARTMENT
HOUSING SERVICES DIVISION**

www.tempe.gov

**P.O. BOX 5002
21 E. Sixth Street, Suite 214
Tempe, Arizona 85280-5002**

**Business Telephone:
480/350-8950**

**Telecommunications Device for the Deaf (TDD):
480/350-8913**

**Information Line
480/350-8974**

**FAX:
480/350-8902**

**Office Hours:
Monday through Friday
7:00 a.m. to 5:00 p.m.**

**Reasonable accommodations for persons with
disabilities may be requested.**



TEMPE CITY COUNCIL MEMBERS

Neil G. Giuliano, Mayor
Barbara Carter, Vice-Mayor
P. Ben Arredondo
Dennis J. Cahill
Leonard Copple
Pam Goronkin
Mark W. Mitchell

TEMPE CITY MANAGER

Will Manley, City Manager
Patrick Flynn, Assistant City Manager

TEMPE HOUSING SERVICES STAFF

Dave Fackler, Development Services Manager
Terri Amabisca, Deputy Development Services Manager
Liz Chavez, Housing Services Supervisor
Patty Hatvick, Grants Accountant
Miguel Anaya, Housing Grants Specialist
Maryna Leyvas, Housing Grants Specialist
Rachel Perez, Housing Grants Specialist

SPECIAL THANKS TO:

Joe Nucci, Senior Planner
Roger Vermillion, Inspection Superintendent
Mike Williams, Deputy Development Services Manager

PRODUCED BY THE CITY OF TEMPE HOUSING SERVICES DIVISION
February, 1999
Revised: May, 2003

Standards for Rehabilitation

STANDARDS FOR REHABILITATION

	<u>Page</u>
Section 1 Program Overview	
1.1 Housing Improvement Program (HIP)	1
1.2 Emergency Rehabilitation Grant Program	2
1.3 HIP & Emergency Grant Program	2
 Section 2 Housing Improvement Program Process	
2.1 Priority One: Existing Code Violations	4
2.2 Priority Two: Deteriorating Items	6
2.3 Priority Three: Energy Conservation	7
2.4 Priority Four: Other Eligible Items	7
2.5 Ineligible Activities	7
2.6 Initial Inspection	7
2.7 Scope of Work	8
2.8 General Contractor Selection	8
2.9 Contractor Inspection (Walk-through)	9
2.10 Contractor Bids	10
2.11 Bid Review	10
2.12 Housing Improvement Program Contract Signing	10
2.13 Notice to Proceed	11
2.14 Contractor Inspections/Payments	11
2.15 Change Order Process	11
2.16 Final Walk-through/Project Completion	11
2.17 Final Payment	12
2.18 Deed of Trust	12
2.19 Project Information/Warrantees	12
2.20 On-going Maintenance	13

PREFACE

This document is produced to enhance communication between participants in the rehabilitation process. Federal, State, local agencies, contractors, and clients were pursued for criticism and feedback in our effort to provide a useful and convenient program reference. Rehabilitation programs change over time and we hope to continue the dialog with program participants to maintain this reference up-to-date. We welcome your comments and suggestions for improving this work. Please forward comments regarding these Standards for Rehabilitation to the City of Tempe Housing Services Division, P.O. Box 5002, Tempe, AZ 85280-5002, so that future editions may be improved.

		<u>Page</u>
Appendix A	Program Definitions	14
Appendix B	Applicability	17
Appendix C	HUD Minimum Property Standards	
	C.1 HUD Minimum Property Standards	19
	C.2 HUD Residential Building Code Comparison	19
	Items	
	C.3 HUD Model Codes	21
	C.4 HUD Construction Requirements	21
	C.5 HUD Supplemental Information for Use	26
	With Building Codes	
	C.6 HUD Incorporation By Reference of	26
	Minimum Property Standards	
	C.7 HUD Description/Identification of Minimum	26
	Property Standards	
	C.8 HUD Building Products or Materials Certification	27
	Program	
Appendix D	Technical Sections	
	D.1 Introduction	28
	D.2 Fire Safety	29
	D.3 Light and Ventilation	30
	D.4 Structural Loads and Seismic Design	31
	D.5 Foundation Systems	32
	D.6 Material Standards	33
	D.7 Construction Components	33
	D.8 Glass	36
	D.9 Mechanical	37
	D.10 Plumbing	38
	D.11 Electrical	39
Appendix E	Rehabilitation Guidelines	
	E.1 Introduction	41
	E.2 General	41
	E.3 General Use	41
	E.4 Sitework	42
	E.5 Concrete	43
	E.6 Masonry (reserved)	43
	E.7 Metals (reserved)	43
	E.8 Wood & Plastics	43
	E.9 Thermal & Moisture Protection	43
	E.10 Doors & Windows	45
	E.11 Finishes	46

		<u>Page</u>
	E.12 Specialties (Reserved)	50
	E.13 Equipment	50
	E.14 Furnishings (Reserved)	51
	E.15 Special Construction	51
	E.16 Conveying (Reserved)	51
	E.17 Mechanical (Reserved)	51
	E.18 Electrical (Reserved)	51
Appendix F	Guidelines Applications & Interpretations	
	F.1 Access Exit Facilities Emergency Escapes – UBC Sec. 310	52
	F.2 Light and Ventilation – UBC Sec. 310.5 & 1203	52
	F.3 Shear Wall Hold-downs – UBC Sec. 1603.3.5	53
	F.4 Metal Plate Connectors – UBC Sec. 2311.6	54
	F.5 Shear Wall Nailing – UBC Sec. 2314.1	54
	F.6 Fireblocks and Draftstops – UBC Sec. 708	54
Exhibit A	Notice to Proceed	56
Exhibit B	HIP Contract	57
Exhibit C	Contractor Payment Request	59
Exhibit D	Notice of Completion	61

STANDARDS FOR REHABILITATION

Section 1: Program Overview

The City of Tempe's Housing Services Division has been serving our community since 1972. For the past 30 years, the Housing Services Division has made a difference in our City by providing facilities and services, which would otherwise not have been available to those citizens who need assistance. Throughout the community, homes have been rehabilitated or replaced, new streets created, and water, sewer, and storm drain systems provided. Redevelopment of the downtown is an example of commercial revitalization and of the success this program continues to enjoy. The Housing Services Division currently administers federally funded programs. These programs are the Community Development Block Grant (CDBG) Program, and the Home Investment Partnerships (HOME) Program. In addition, the Division may administer city Capital Improvement Program (CIP) funds for affordable housing programs and housing improvement programs.

The Community Development Block Grant Program is authorized under Title I of the Housing and Community Development Act of 1974, as amended. The Home Investment Partnerships Program is authorized under Title II of the National Affordable Housing Act of 1990. Both programs provide funds to expand the supply of affordable housing available for very low-income and low-income persons.

The primary objective of the national CDBG program, administered by the United States Department of Housing and Urban Development (HUD), is the support of communities through the provision of decent housing, a suitable living environment, and economic opportunity for low- and moderate-income persons.

The primary objective of the national HOME program, administered by the United States Department of Housing and Urban Development (HUD), is to implement local housing strategies designed to increase homeownership and affordable housing opportunities for low- and very-low income Americans and to expand the supply of decent, safe, sanitary, and affordable housing through acquisition, rehabilitation, and new construction.

The City of Tempe participates in the CDBG Program and the Maricopa County HOME Consortium. Each year the city receives CDBG funds directly from HUD and HOME funds from Maricopa County. The City designates a portion of these funds for the conservation and enhancement of Tempe neighborhoods through residential rehabilitation and related public improvements.

The primary purpose of the City of Tempe CDBG/HOME programs is to further the goal of providing a decent house and a suitable living environment to all citizens, and the preservation of older Tempe neighborhoods. The City of Tempe is responsible for assuring that each program activity using Federal funds meets one of three national objectives:

- Benefits low and moderate income persons.
- Aids in the prevention or elimination of slums and blight.
- Relieves an urgent need.

Tempe operates the following programs for rehabilitation of residential properties:

1.1 Housing Improvement Program (HIP)

This program provides low interest or interest free (deferred) loans of up to \$25,000, to income eligible homeowners. This loan is secured with a Deed of Trust and has repayment requirements unless the property is sold or transferred during the life of the loan. This program is targeted to homeowners who do not have the financial resources to service a standard loan to make necessary repairs to their residences.

1.2 Emergency Rehabilitation Grant Program

This program provides a grant of up to \$7,500 to income eligible homeowners to make necessary repairs to their residences, addressing problems that create an immediate threat to the life, safety, and health of the residents. Emergency items may include faulty wiring, leaking roofs, plumbing and/or sewer problems, air conditioning or evaporative coolers.

1.3 HIP & Emergency Rehabilitation Grant Program pay special attention to:

- **Architectural Barriers** – Addresses the removal of material and architectural barriers that restrict the mobility of and accessibility to the elderly and persons with disabilities.
- **Energy Conservation** – Addresses energy conservation remedies such as additional insulation, evaporative coolers and upducts, water saving shower heads and toilets, weather stripping and dual pane windows.
- **Lead-based Paint Hazards** – Addresses lead-based paint hazard evaluation and reduction and provide remedies such as removal of lead-based paint, permanent containment or encapsulation, replacement of surfaces or fixtures, and removal or covering of contaminated soils.
- **Re-evaluation of Lead Hazards** – The condition of all known or suspected lead-based painted (LBP) building components should be evaluated on a yearly basis, following the completion of interim controls. All deteriorate LBP identified by the re-evaluation process should be promptly repaired or removed using appropriate methods of LBP abatement. As per 24 CFR 35 (III)(E)(15)(I), Ongoing Lead-Based Paint Maintenance and Reevaluation, a standard reevaluation schedule consisting of intervals of two years, plus or minus sixty (60) days, is recommended. If two

consecutive reevaluations at two-year intervals find no lead-based paint hazards, no further reevaluation is required. Reevaluations should be conducted by a Certified Risk Assessor and should include both a visual examination and environmental sampling for lead-contaminated dust (and sometimes soil). Reevaluations are supplemented with visual surveys by the owner (or the owner's representative), which should be conducted at least once a year. Visual surveys do not replace reevaluations.

Section 2: Housing Improvement Program Process

Congratulations, your voluntary participation in the City of Tempe's Housing Improvement Program is the first step toward improving your property and increasing the safety and comfort of your home. While you are waiting for construction to begin, we ask that you look ahead and prepare for the activities that are about to take place. The following information explains the Housing Improvement Program process step-by-step, beginning with the initial inspection of your home and determination of eligible repairs.

These Standards for Rehabilitation identify general program requirements pertaining to quality of workmanship, materials standards, code and regulatory requirements, and specific program requirements. We hope to increase your convenience in working with these programs by bringing this information together in this single comprehensive reference.

As can be seen, the form of agreement for rehabilitation work is a Housing Improvement Program Contract between the homeowner and the general contractor. The City of Tempe is not party to the Housing Improvement Program Contract. In this arrangement, the City of Tempe Housing Grants Specialist functions in a role similar to that of an architect; representing the interests of both parties to the contract each to the other and with the ultimate goal of facilitating successful completion of the contract. You should consider the Housing Grants Specialist to be a ready resource available to assist you in fulfilling contractual program obligations and providing you with information about program requirements.

You will notice the Housing Improvement Program Contract has been designed to balance the performance responsibilities of both parties. The contract contains a flexible series of payment methods and has been kept as brief and understandable as possible.

Remember, if you have any questions, the Housing Grants Specialist can be reached at the City of Tempe Housing Services Division at 480-350-8950 (TDD: 480-350-8913).

Rehabilitation is not remodeling. The use of program funds requires addressing items in the order of program priorities. The Housing Grants Specialist will prioritize existing conditions into one of four categories: existing code violations, deteriorating items, energy conservation items, and other eligible items.

2.1 Priority One: Existing Code Violations

Priority one items are first to be addressed. Other items can only be addressed after code violations have been corrected. The Housing Grants Specialists will notify the City of Tempe Building Safety Division of existing structural code violations.

Depending on the extent of deficiencies in this category, the project budget may not cover all priority one items. In this case, rehabilitation may not be feasible. Logically, it does not make sense to improve a building without first taking care of the basic defects.

The goal in building code compliance is to correct all existing deficiencies in a dwelling affecting the safety of the occupants and which, if not corrected, will allow the building to deteriorate to the point where it will not meet minimum health and safety standards.

The following is a list of typical priority one items.

- There must be a sound, watertight roof, with a projected useful life of at least ten years.
- There must be an adequate and safe heating and cooling system serving the entire living space with a reasonable long projected operating life.
- There must be safe and sanitary plumbing with the system in good operating order.
- There must be a minimum of 100-amp electrical service with no unsafe conditions.
- There must be paint on all wood and applicable metal surfaces of the house exterior in an adequate state of repair, in generally stable condition, and with no rotted material.
- There must be a sound structural system with all components considered serviceable for the expected useful life of the building.
- There must be adequate drainage and land contour to prevent water ponding or penetrating into the house. The foundation must be protected from erosion or standing water.
- There must be adequate kitchen facilities, including a sink, cooking and refrigeration equipment, and sanitary storage space.
- There must be a structural termite inspection if evidence of wood destroying insects exists. The premises must be free from vermin.
- There must be domestic hot water for the kitchen and bath. If laundry facilities are present, adequate hot water must be supplied for this purpose.
- There must be interior surface finishes on ceilings, walls, and floors appropriate to the use of these areas.
- There must be adequate sleeping and storage space based on the number of family members living in the household.
- There must be weather tight interior, attic, and crawl spaces so that energy efficiency can be maintained at a reasonable cost.
- There must be weather tight exterior openings, with locks on exterior doors and, where appropriate, screens for windows. All habitable rooms must have adequate light and ventilation.
- There must be smoke detectors present and operational in compliance with current code requirements. The house must be safe from fire hazards.
- In short, health or safety hazards must be removed or abated, including lead-based paint, unsafe stairs, etc.

The preceding list is not inclusive of all priority-one items; however, it provides basic information and guidance in considering important rehabilitation activities. Failure to correct this type of problem, if it exists on your property, would not meet the intent of the Housing Improvement Program.

In addition to the major code violations identified above, defects of less magnitude should also be corrected if they exist. The objective is to make the house as comfortable as possible within the budget of the grant or loan program. The following are examples of minor deficiencies that would have high program priority.

- Adding insulation to attic or crawl spaces where it may be inadequate.
- Improving inadequate attic ventilation.
- Pointing-up brick or minor cracks to ensure continued soundness.
- Properly grounding existing electrical outlets or devices.
- Repairing chipped interior surfaces.
- Repairing missing or broken window sash or panes.
- Repairing uneven floor finish materials or replacing missing floor tiles.
- Replacing missing interior moldings and trim at doors and windows.

2.2 Priority Two: Deteriorating Items

The Housing Grants Specialist is aware of the normal life expectancies of the major component parts of a building. Any deteriorating items that are likely to require replacement or major repair within the fifteen (15) year term of the loan are included in this priority-two category.

Examples of typical priority two items include: a hot water heater beyond its normal 8 (eight) to 12 (twelve) year life expectancy, a gas appliance more than twenty-five (25) years old, an asphalt shingle roof more than fifteen (15) years old, or any other items showing considerable wear or, presenting potential future problems.

Major repairs occurring after rehabilitation is completed may compromise the effectiveness of the work. The City's Housing Improvement Program commits the contractor to warrantee their work for a twelve (12) month period after final acceptance. The program also commits you, as the homeowner, to provide adequate maintenance for the term of the loan.

The following are typical building component life expectancies.

- Air Conditioning Compressor – eight (8) to fifteen (15) years
- Asphalt Fiberglass Shingle Roof – twelve (12) to fifteen (15) years
- Built-Up Roof (also Membrane Roof) – fifteen (15) to twenty (20) years
- Clay Tile Roof – thirty (30) to fifty (50) years
- Electric Furnace – fifteen (15) to twenty (20) years
- Electric Baseboard Heater – ten (10) to fifteen (15) years
- Gas Furnace – fifteen (15) to twenty (20) years
- Galvanized Plumbing – twenty (20) to thirty (30) years
- Electric Heat Pump – ten (10) to fifteen (15) years
- Hot Water Heater – eight (8) to twelve (12) years

2.3 Priority Three: Energy Conservation

Improvements to conserve energy or increase utility savings are eligible program activities. Usually energy improvements with a payback of five (5) years or less are considered. Examples include additional insulation, evaporative coolers and up-ducts, water saving showerheads and toilets, weather stripping, and dual pane windows.

2.4 Priority Four: Other Eligible Items

Many items identified by the homeowner may qualify as eligible program activities. If the project budget allows, these items may be included after all higher priority items have been corrected.

2.5 Ineligible Activities

The general rule is that any activity not specifically authorized under federal regulations is ineligible to be assisted with federal funds. In addition, the regulations stipulate that the following activities may not be assisted with federal funds:

- (1) Building for the general conduct of government
- (2) General government expenses
- (3) Political activities
- (4) New housing construction except under certain conditions or when carried out by a Community Based Development Organization
- (5) Income payments
- (6) Religious entities and activities
- (7) Purchase of equipment, fixtures, and other property which is not an integral structural fixture
- (8) Operating and maintenance expenses

2.6 Initial Inspection

After eligibility for the program is determined, the next step in the HIP process is to determine what conditions exist at your property that may be eligible for rehabilitation assistance. You will schedule an inspection of the property with a Housing Grants Specialist from the City's Housing Services Division. The purpose of this initial inspection is to identify a preliminary scope of work and to discuss general contractor selection. This initial site visit involves preparing a complete list of existing conditions that must be addressed by the rehabilitation process.

Note: The rehabilitation contract may not ultimately include all items on this initial list. Items will be prioritized and included in the contract when the overall project cost has been determined. (See items 2.1-2.4),

The initial inspection will consider the complete property, including yard areas, all rooms of the house, and all features and accessory buildings on the site. The initial inspection takes time and should be scheduled when you can conveniently set aside one or two hours free from distractions or other obligations. If access is not available, or if for some other reason a room or part of the property owned couldn't be inspected during the initial visit, a second inspection will be scheduled. In the event that some aspect of the work requires specialized expertise to evaluate, the Housing Grants Specialist will arrange to return to the site with a trade expert or other appropriate person.

2.7 Scope of Work

The Housing Grants Specialist will complete a scope of work for the project to determine necessary repairs. This scope will indicate activities based on the above priority basis. The information will be helpful in estimating an overall project budget.

2.8 General Contractor Selection

Once a preliminary scope of work has been determined, the homeowner will be asked to select a minimum of two general contractors to competitively bid on your project. You may select more than two contractors if you wish.

Selecting a general contractor can be the most important step in rehabilitating your home. For your convenience, the City provides information on what you should look for in selecting a general contractor. (See Appendix 1) This information is provided to help you select a general contractor with the proper experience and ability to successfully complete the type of work you are considering. The information provided by the City is only a guide. You must select a licensed and bonded general contractor to work on your home.

The City of Tempe is not party to the Housing Improvement Program Contract and does not recommend or endorse general contractors participating in the program. All general contractors meeting the following minimum qualifications to participate in the Tempe Housing Improvement Program:

- Contractors must be licensed by the State of Arizona Registrar of Contractors to perform the type of work required.
- Contractors must be adequately insured or bonded for the full value of the project.
- Contractors must not be listed on any "List of Parties Excluded From Procurement and Non-procurement Programs" (Debarred List) as maintained by the State of Arizona or the United States Department of Housing and Urban Development. (<http://epls.arnet.gov>)
- Contractors must be able to commence and complete the work proposed in a timely manner.
- The homeowner may not be the general contractor.
- Contractors must complete and return to the City of Tempe any additional paperwork as required prior to commencing any project.
- Better Business Bureau (www.bbb.org)

According to the National Remodeling Council, selection of a general contractor should consider current references and recommendations, established credentials, check for professional affiliations, and include visits to previously completed projects.

References and recommendations should be current. Many established firms take on new characteristics when key personnel or circumstances change. In Arizona, all general contractors are required to be licensed by the Registrar of Contractors. While professional affiliations are not mandatory, they may provide an insight into the company's business philosophy. Finally, visits to completed projects may be a source for new ideas, or may indicate the strengths and weaknesses of a particular company. The Homeowner/Contractor relationship is an important part of the rehabilitation process. Communication will be frequent and is critical to the rehabilitation process.

Once a minimum of two general contractors has been selected, a contractor selection affidavit will be completed and placed in the project file. The contractor selection affidavit form must be on file at the City prior to issuance of the "Notice To Proceed." (See Exhibit A)

2.9 Contractor Inspection (Walk-through)

When the contractor selection affidavit is on file, the Housing Grants Specialist will meet with you and your prospective contractors at the project site for a contractor inspection (walk-through) to discuss the project. The purpose of this inspection is to review project conditions, discuss the format and content of a proposal for the work, and answer questions so the contractor can prepare an accurate proposal. The Housing Grants Specialist will review the information from the initial inspection with the homeowner and the selected contractors.

The previously prepared scope of work will be reviewed at this inspection (walk-through). The Housing Grants Specialist will explain program priorities and eligible activities. The homeowner, selected contractors, and the Housing Grants Specialist will inspect and discuss the property while considering project budget and program priorities. The time frame for completing and returning the contractor bids and the proposed construction schedule will be discussed.

This is the time to discuss strategies, solutions, and methods with the selected contractors to minimize the inconvenience and disruption that accompanies construction. Unrestricted access to the work is critical to the contractor's time of performance. Delays caused by problems of accessibility beyond the control of the contractor constitute grounds for extension of the contract schedule. The homeowner is responsible for providing access to the work in accordance with the terms and conditions of the contract.

2.10 Contractor Bids

Once the contractor inspection (walk-through) has occurred, the contractors will prepare bids based on the scope of work. The scope of work may be revised in consideration of the available project budget. The homeowner will work directly with the Housing Grants Specialist to finalize the scope of work. If there are questions regarding the nature of the work or the type of materials to be used, this is the time to contact the Housing Grants Specialist as well as the contractors for clarification.

The scope of work will serve to indicate the priority category of proposed rehabilitation activities and will ultimately determine what repairs can and cannot be performed on the project.

The Housing Grants Specialist will provide copies of the preliminary bids for the homeowner's review. The homeowner will review the bids to ensure they address an acceptable scope of work. Review the bids carefully, as they describe the work to be completed and should include preliminary labor and material specifications.

2.11 Bid Review

A bid review is conducted by City staff and is required before awarding the project to one of your selected general contractors. The bids are reviewed according to pricing, quantities, materials, and any additional notes.

The recommended bid selection is based on pricing and responsiveness to the scope or work. Once the bid review is complete, the homeowner will be notified of the Housing Grants Specialists recommendation for final approval.

2.12 Housing Improvement Program Contract Signing

When the homeowner and the City have approved the bid, the Housing Grants Specialist will prepare a contract for signatures. The contract spells out the terms and conditions under which the work will be done. Site access, time of performance, compensation, and scope of work are all identified in the contract. (See Exhibit B).

The Housing Improvement Program Contract utilized by the City of Tempe includes the following requirements:

- Scope of work by reference to plans and specifications prepared by the Housing Grants Specialist and the general contractor.
- Access to the work and restrictions constituting grounds for delay claims.
- Insurance policy limits, lien waivers, and equal employment opportunity regulations.
- Standards of workmanship, warranties, standards for rehabilitation, and defects discovered after completion.

- Compensation and methods of payment as previously discussed and arranged in consultation with the Housing Grants Specialist.
- Permits, licenses, and surveys required for the work.
- Conditions for terminating the agreement.

The Housing Improvement Program contract contains the entire agreement between you and the general contractor and is all-inclusive. Any offers or limitations not specifically identified in the contract are not binding. The City of Tempe must approve any deviations.

2.13 Notice to Proceed

The City issues the Notice to Proceed to the selected contractor. Construction must begin within 5 (five) days of the issuance of the Notice to Proceed. Under certain conditions, the time frame may be reviewed on a case by case basis.

2.14 Contractor Inspections/Payments

The Housing Grants Specialist will conduct an inspection to observe the progress of the work prior to processing any contractor payment requests. The Contractor shall submit a contractor payment request to the homeowner for approval. (See Exhibit C). Payments are made to the Contractor on behalf of the homeowner, within thirty (30) days of receipt of a complete submittal approved by the homeowner.

2.15 Change Order Process

Residential rehabilitation often involves unforeseen conditions as the work in progress reveals concealed structural elements or as other circumstances come to light. The Housing Grants Specialist is aware of potential for changes in scope as the work progresses and is prepared to adjust the contract as necessary by the Change Order Process. The general contractor proceeds at his own risk until both the homeowner and the City have signed the change order form.

Under no circumstance will there be any deviation from the contract without proper execution of a CHANGE ORDER as required and provided for in the Housing Improvement Contract.

2.16 Final Walk-through/Project Completion

The final phase of the construction process is project completion. The general contractor, homeowner, and the Housing Grants Specialist will conduct a final walk-through. If any items are observed which are not in compliance with the scope of work, the general contractor shall complete or correct the item and request an additional final inspection. When all items have been completed or resolved, the homeowner will approve the

general contractor's payment request for final payment and the warrantee period will begin.

2.17 Final Payment

If permits were required, the City of Tempe Building Safety Division must also conduct a final inspection and "sign off" on all permits. The general contractor may then prepare a request for final payment to be approved by the homeowner.

After the final payment request has been submitted and approved, a "Notice of Completion" form will be signed by the contractor and notarized by the City of Tempe. (See Exhibit D).

2.18 Deed of Trust

If you have a deferred or amortized loan, the City of Tempe will place a lien on the property secured by a Deed of Trust. A Note and Deed of Trust will be prepared for signature by the homeowner. This Deed of Trust obligates the homeowner to keep the property in good condition and repair, insured against loss by fire or other hazards, and to pay all payments required by the loan agreement in addition to all taxes and assessments. The lien on the property will be released dependent on the terms and conditions of the note.

If you are participating in the Emergency Rehabilitation Grant Program, no lien or Deed of Trust is placed on the property.

2.19 Project Information/Warrantees

In accordance with the terms and conditions of the Housing Improvement Program Contract, the contractor shall guarantee the work performed on this contract for twelve (12) months from the date of final completion. The general contractor at their expense shall correct any defects that appear within this twelve-month period resulting from defective or improper materials or workmanship. The homeowner shall notify the general contractor in writing, with a copy of the letter sent to Tempe Housing Services, of any suspect conditions that become apparent during the period of this warranty.

The general contractor shall prepare and provide to the homeowner paperwork and information including:

- General Contractor Information – Contractor names, addresses, and telephone numbers. Identification of key office and field personnel to contact for project specific questions during normal business hours. Emergency contact phone numbers.
- Warranties – Copies of all materials and equipment warranties applicable to this work.

- Maintenance Information – Copies of all materials and equipment manufacturer's operation and maintenance information, parts lists and diagrams, schematics and service data applicable to this work.
- Safety Information – Copies of consumer product safety data and other information as necessary to communicate the safety features of building systems and components to the homeowner.
- Other Project Information – Copies of additional related project data and contractor information as may be appropriate.

2.20 On-going Maintenance

The homeowner is required to maintain improvements made under the Housing Improvement Program. The general contractor will provide information on items that require periodic maintenance.

Typical items that require maintenance and are your responsibility include:

- Air Conditioning and Furnace Filters – Filters must normally be changed every thirty (30) days. Failure to change filters at the scheduled maintenance period decrease energy efficiency, diminishes performance, and can result in deterioration of the mechanical equipment.
- Evaporative Cooler Winterization – At the end of each cooling season the annual maintenance procedures identified by the equipment manufacturer must be completed.
- Smoke Detectors – Smoke detectors should be checked every thirty (30) days.

Appendix A Definitions

Act – the United States Housing Act of 1937 (42 U.S.C. 1437 et. Seq.)

Building Official – the Manager, City of Tempe Development Services Department or his/her designee.

CDBG – Community Development Block Grant funds received in the form of grants or loans.

CIP – Capital Improvement Project funds received from the City of Tempe.

City – the City of Tempe, Maricopa County, Arizona.

Code – the Tempe Building Code, the Tempe Electrical Code, the Tempe Mechanical Code, the Tempe Plumbing Code, the Tempe Fire Code as amended or any combination thereof.

Consolidated Plan – the plan prepared by the City of Tempe in accordance with 24 CFR part 91, which describes needs, resources, priorities and proposed activities to be undertaken with respect to HUD programs including the CDBG program.

Fair Housing Choice – the ability of persons regardless of race, color, religion, sex, familial status, handicap or national origin or similar income levels to have available to them the same housing choices.

Family – all persons living in the same household who are related by birth, marriage, or adoption.

General Contractor – licensed, bonded, and insured residential general contractor eligible to enter into contracts and perform work in the City of Tempe Housing Rehabilitation Program.

Housing Quality Inspection (HQS) - The HUD minimum quality standards for housing assistance under the Section 8 Housing Choice Voucher Program.

Historic Preservation – the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical, and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.

Historic Rehabilitation – the act or process of making possible an efficient compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values.

Historic Restoration – the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical, and plumbing services and other code-required work to make properties functional is appropriate within a restoration project.

Historic Reconstruction – the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location.

Homeowner – The legal title holder to the residence

Housing Grants Specialist – an employee of the City of Tempe Development Services Department, Housing Services Division.

Housing Services Division – a Division of the City of Tempe Development Services Department.

HUD – the United States Department of Housing and Urban Development.

Impediments to Fair Housing Choice – any actions, omissions, or decisions taken because of race, color, religion, sex, familial status, handicap or national origin which restrict housing choices or the availability of housing choices on the basis of race, color, religion, sex, familial status, handicap or national origin.

Income Qualified – a household or person meeting current HUD income limits for low- or moderate-income and is eligible to participate in the City of Tempe Housing Rehabilitation Program on a voluntary basis.

Listed and Listing – equipment and materials which are shown in a list published by an approved testing agency qualified and equipped for experimental testing and maintaining an adequate periodic inspection of current productions and which listing states that the material or equipment complies with accepted national standards which are approved, or standards which have been evaluated for conformity with approved standards.

Low Income Household/Person:

- **Extremely Low** – a household/person having an income equal to or less than 30% of area median income for Maricopa County as annually established by HUD
- **Very Low** - a household/person having an income equal to or less than 50% of area median income for Maricopa County as annually established by HUD
- **Lower-** a household/person having an income equal to or less than 60% of area median income for Maricopa County as annually established by HUD

- **Low** - a household/person having an income equal to or less than 80% of area median income for Maricopa County as annually established by HUD
- **Median Income** – a household/person having an income equal to or less than 100% than the current Section 8 Low Income Limit as established annually by HUD but greater than the current Very Low Income Limit established annually by HUD
- **Above Income** - a household/person having an income equal to or less than 120% than the current Section 8 Low Income Limit as established annually by HUD but greater than the current Very Low Income Limit established annually by HUD

Ordinance – the current edition of the Tempe Zoning Ordinance 808, the current edition of the Tempe Historic Preservation Ordinance 95.35, or any combination thereof.

Owner/occupant – a homeowner who maintains their permanent residence at the subject location and has done so continuously for a period of not less than six (6) months prior to making application to the City of Tempe Housing Improvement Program.

Rehabilitation – the restoration of a reusable single structure or group of structures which overcomes deterioration and provides a satisfactorily improved physical condition for residential purposes.

Repair – restoration to a sound and acceptable state of operation, serviceability or appearance. Repairs shall be expected to last approximately as long as would the replacement by new items.

Replace – to remove an existing item, assembly, or system and to construct or install a new item, assembly, or system of similar or improved quality. Replacement will typically occur where the item, assembly, or system is incapable of repair or where repair would be more costly.

Shall – an action that is required.

Should – an action that is good practice but is not mandatory.

Substandard Building – any building or portion thereof in which there exists physical conditions of sufficient magnitude to pose a threat to the life, safety, or health of the occupants or the public.

Appendix B Applicability

The following codes and standards govern the work of the Housing Improvement Program. All housing rehabilitated or constructed under the City of Tempe's Housing Improvement Program shall meet or exceed HUD Minimum Property Standards. Each property shall comply with:

- (1) The Tempe Building Code which consists of the Uniform Building Code (UBC) 1994 Edition and the City of Tempe Amendments to the 1994 UBC contained in Section 8-300, Chapter 8 of the Tempe City Code.
- (2) The Tempe Electrical Code which adopts by reference the 1999 Edition of the National Electrical Code (NEC) with City of Tempe Amendments to the 1999 NEC contained in Section 8-404, Chapter 8 of the Tempe City Code.
- (3) The Tempe Mechanical Code which consists of the Uniform Mechanical Code (UMC), 1991 Edition, and the City of Tempe Amendments to the 1991 UMC contained in Section 8-600, Chapter 8 of the Tempe City Code.
- (4) The Tempe Plumbing Code which consists of the Uniform Plumbing Code (UPC) 1991 Edition, and the City of Tempe Amendments to the 1991 UPC contained in Section 8-704, Chapter 8 of the Tempe City Code.
- (5) The Tempe Fire Code which consists of the Uniform Fire Code (UFC) 1997 Edition, and the City of Tempe Amendments to the 1997 UFC contained in Sections 14-1 through 14-41, Chapter 14 of the Tempe City Code.
- (6) The Tempe Zoning Ordinance 808.363, effective January 18, 1986, which provides minimum requirements for the promotion of a comprehensive plan for the protection of the citizens of Tempe and is contained in Section 35-1, Chapter 35 of the Tempe City Code.
- (7) The Tempe Historic Preservation Ordinance 95.35, effective November 9, 1995, which provides guidelines, standards, and process for review or alteration, new construction, and demolition or removal of Tempe historic properties and is contained in Section 14A-1, Chapter 14A of the Tempe City Code.

The rehabilitation standards contained in this manual are adapted to the physical and regulatory conditions prevailing in the City of Tempe and serve the following basic purposes:

- (1) They are used as standards in the inspection and evaluation of conditions of residential properties to be considered for rehabilitation.
- (2) They are part of the criteria for determining whether rehabilitation is feasible for individual residential properties.

- (3) They serve as minimum standards to which individual residential properties shall be improved if rehabilitation is undertaken.

The Housing Services Director and Housing Services Supervisor establish policies and procedures for implementing requirements for the Housing Improvement Program in the City of Tempe.

Conflicting Standards – HUD Minimum Property Standards do not replace City of Tempe Code requirements; however, a property shall be eligible for rehabilitation assistance only if it complies with these minimum property standards. These standards set basic objectives specifically related to rehabilitation, and shall not relieve the property owner, program staff, program administrators, or contractor of responsibility for compliance with local ordinances, codes, and regulations including established requirements of a health officer or other authority having jurisdiction. Where a local code, regulation, or requirement is incomplete or does not fulfill the purpose and intent of this document, local standards derived from these standards shall apply.

Appendix C HUD Minimum Property Standards

The following standards provide the actual text of the HUD Minimum Property Standards (MPS) as contained in Title 24 Code of Federal Regulations, Part 200. In order to conserve the exact text of these standards, the sub-part numbers have been identified with footnotes at the end of the section.

The reader's attention is directed to Article 6, wherein HUD incorporates information contained in Handbooks published by the Department. The information provided in these HUD MPS Handbooks is widely familiar to contractors and others in the building trades. HUD MPS are cited by the Uniform Building Code, the Arizona Registrar of Contractors, and generally throughout the industry as the basis for workmanship and materials standards in residential construction. Anyone with knowledge of the trades should be comfortable with these familiar minimum performance requirements.

HUD MINIMUM PROPERTY STANDARDS FOR ONE AND TWO FAMILY DWELLINGS 200.926

C.1 HUD Minimum property standards for one and two family dwellings¹

- (a) *Construction standards-Applicable structures.* The standards identified or contained in this section and in §§200.a-200.926e shall apply to single family detached homes, duplexes, and units in a structure where the units are located side-by-side in town house fashion.
- (b) *Conflicting standards.* The requirements contained in §200.926d do not preempt local or State standards, nor do they alter or affect a contractor's obligation to comply with any local or State requirements.
- (c) *Standard for evaluating local or state building codes.* The Secretary shall compare a local building code submitted for evaluation to the list of construction related areas to be regulated and the code will be accepted if it regulates each area and sub-area on the list. Note that the Uniform Building Code, Uniform Mechanical Code, Uniform Plumbing Code, and the National Electric Code including Appendices and Supplements, have been so reviewed and approved by the Secretary, and incorporated by reference at §200.925c Model codes, into these Minimum Property Standards.

C.2 HUD Residential building code comparison items²

- (a) Fire safety.
 - (1) Allowable height and area;
 - (2) Fire separations;
 - (3) Fire resistance requirements;
 - (4) Egress doors and windows;
 - (5) Unit smoke detectors;
 - (6) Flame spread.
- (b) Light and ventilation.

- (1) Habitable rooms;
- (2) Bath and toilet rooms.
- (c) Structural loads and seismic design
 - (1) Design live loads;
 - (2) Design dead loads;
 - (3) Wind loads;
 - (4) Earthquake loads.
- (d) Foundation systems.
 - (1) Foundation depth;
 - (2) Footings;
 - (3) Foundation materials criteria.
- (e) Materials standards.
 - (1) Materials standards.
- (f) Construction components.
 - (1) Steel;
 - (2) Masonry;
 - (3) Concrete;
 - (4) Gypsum;
 - (5) Lumber;
 - (6) Roof construction and covering;
 - (7) Chimneys and fireplaces
- (g) Glass.
 - (1) Thickness/are requirements;
 - (2) Safety glazing.
- (h) Mechanical;
 - (1) Heating, cooling, and ventilation systems;
 - (2) Gas, liquid, and solid fuel piping and equipment;
 - (3) Chimneys and vents;
 - (4) Ventilation
- (i) Plumbing.
 - (1) Materials standards;
 - (2) Sizing and installing drainage systems;
 - (3) Vents and venting;
 - (4) Traps;
 - (5) Cleanouts;
 - (6) Plumbing fixtures;
 - (7) Water supply and distribution;
 - (8) Sewage disposal systems.

- (j) Electrical.
 - (1) Branch circuits;
 - (2) Services;
 - (3) Grounding;
 - (4) Wiring methods;
 - (5) Cable;
 - (6) Conduit;
 - (7) Outlets, switches and junction boxes;
 - (8) Panelboards.

C.3 HUD Model Codes³

Those provisions of the model code that establish energy requirements for one and two family dwellings shall not apply.

C.4 HUD Construction requirements⁴

(a) Application—

- (1) *General.* These standards cover agency requirements for accessibility to physically handicapped people, variations to standards, real estate entity, trespass and utilities, site conditions, access, site design, dedication of utilities, drainage and flood hazard exposure, special construction and product acceptance, thermal requirements and water supply systems.
- (2) *Requirements for accessibility to physically handicapped people.* The HUD Field Office will advise project sponsors as to the extent accessibility will be required for new construction of one and two family dwellings on a project by project basis.
- (3) *Variations to standards—*
 - (i) New materials and technologies. See paragraph (d) of this section. Alternatives, nonconventional or innovative methods and materials shall be equivalent to these standards in the areas of structural soundness, durability, economy of maintenance or operation and usability.
 - (ii) *Variation procedure.* Variations from the requirements of any standard with which the Department requires compliance shall be made in the following ways:
 - (A) For a particular design or construction method to be used on a single case project, the decision is the responsibility of the Field Office. Headquarters concurrence is not required.
 - (B) Where a variation is intended to be on a repetitive basis, a recommendation for a Local Acceptable Standard, substantiating data, and background information shall be submitted by the Field Office to the Director, Office of Manufactured Housing and Regulatory Functions.

- (iii) Variances, which require individual analysis and decision in instance, are not considered as repetitive variances even though one particular standard is repeatedly the subject of variation. Such variances are covered by paragraph (a)(3)(ii)(A) of this section.

(b) *General acceptability criteria—*

- (1) *Real estate entity.* The property shall comprise a single plot except that a primary plot with a secondary plot for an appurtenant garage or for other use contributing to the marketability of the property will be acceptable provided the two plots are in such proximity as to comprise a readily marketable real estate entity.

(2) *Service and facilities—*

- (i) *Trespass.* Each living unit shall be one that can be used and maintained individually without trespass upon adjoining properties, except when the windowless wall of a detached dwelling is located on a side lot line. A detached dwelling may be located at a side lot line if:
 - (A) legal provision is made for permanent access for the maintenance of the exterior portion of the lot line wall, and
 - (B) the minimum distances from the dwelling to the dwellings on the abutting properties are not less than the sum, of the side yard distances computed as appropriate for the type of opposing walls. (minimum distance 10 ft.)
- (ii) *Utilities.* Utility services shall be independent for living unit, except that common services shall be common services such as water; sewer, gas, and electricity may be provided for living units under a single mortgage or ownership. Separate utility service shut-off for each living unit shall be provided. For living units under separate ownership, common utility services may be provided from the main to the building line when protected by an easement or covenant and maintenance agreement acceptable to HUD, but shall not pass over, under, or through any other living unit under the same mortgage unless provision is made for repair and maintenance of utilities without trespass or when protected by an easement or covenant providing permanent access for maintenance and repair of the utilities. Building drain cleanouts shall be accessible from the exterior where a single drain line within the building serves more than one unit.

(3) *Site conditions.*

- (i) The property shall be free of those foreseeable hazards and adverse conditions which may affect the health and safety of occupants or the structural soundness of the improvements, or which may impair the customary use and enjoyment of the property. The hazards include toxic chemicals, radioactive materials, other pollution, hazardous activities,

potential damage from soil or other differential ground movements, ground water, inadequate surface drainage, flood erosion, or other hazards located on or off site. The site must meet the standards set forth in 24 CFR part 51, and HUD Handbook 4910.1, section 606 for termite decay protection.

- (ii) When special conditions exist or arise during construction which were unforeseen and which necessitate precautionary or hazard mitigation measures, the HUD Field Office shall require corrective work to mitigate potential adverse effects from the special conditions as necessary. Special conditions include rock formations, unstable soils or slopes, high ground water levels, springs, or other conditions, which may adversely affect a property. It shall be the builder's responsibility to ensure proper design, construction, and satisfactory performance where these conditions are present.

(4) *Access.*

- (i) Each property shall be provided with vehicular or pedestrian access by a public or private street. Private streets shall be protected by permanent easement.
- (ii) Each living unit shall have a means of access such that it is unnecessary to pass through any other living unit.
- (iii) The rear yard shall be accessible without passing through any other living unit.
- (iv) For a townhouse type dwelling, access to the rear yard may be by means of alley, easement, and passage through the dwelling or other means acceptable to the HUD Field Office.

(c) *Site Design—*

(1) *General.*

- (i) A site design shall be provided which includes an arrangement of all site facilities necessary to create a safe, functional, healthful, durable, and energy efficient living environment.
- (ii) Site design standards shall be as specified in the current edition of Ordinance 808, the Zoning Ordinance of the City of Tempe, including amendments that have been adopted and are in effect at the time of permitting.
- (iii) Single family detached houses situated on individual lots located on existing streets with utilities need not comply with the requirements of paragraphs (c)(2), (3), and (4)(iv) of this section.

(2) *Streets.*

- (i) Existing or proposed streets on the site shall connect to private or public streets and shall provide all-weather access to all buildings for essential and emergency use, including access needed for deliveries, service, maintenance and fire equipment.

- (ii) Streets shall be designed for dedication for public use and maintenance or, when approved by the HUD Field Office, may be retained as private streets where protected by permanent easements.
- (3) *Dedication.* Utilities shall be located to permit dedication to the local government or appropriate public body.
- (4) *Drainage and flood hazard exposure—*
 - (i) *Residential structures with basements located in FEMA-designated areas of special flood hazard.* The elevation of the lowest floor in structures with basements shall be at or above the base flood level (100-year flood level) required for new construction or substantial improvement of residential structures under regulations for the National Flood Insurance Program (NFIP)(see 44 CFR 60.3 through 60.6), except where variances from this standard are granted by communities under the Federal Emergency Management Agency (FEMA) at 44 CFR 60.6(a) or exceptions from this NFIP standards for basements are approved by FEMA in accordance with procedures at 44 CFR 60.6(c).
 - (ii) *Residential structures without basements located in FEMA-designated areas of special flood hazard.* The elevation of the lowest floor in structures without basements shall be at or above the FEMA-designated base flood elevation (100-year flood level).
 - (iii) *Residential structures in FEMA-designated “coastal high hazard areas”* Not applicable to Tempe.
 - (iv) *“Critical Actions” as defined in 24 CFR 55.2(b)(2).* The lowest floor of a structure (including the basement and all mechanical, electrical, and service equipment) shall be at or above the FEMA-designated 500-year frequency flood elevation. “Critical Actions” located in the FEMA-designated “floodways” as defined in 24 CFR 55.2(b)(4) are prohibited.
 - (v) *Streets.* Streets must be useable during runoff equivalent to a 10-year return frequency. Where drainage outfall is inadequate to prevent runoff equivalent to 10-year return frequency from ponding over 6 inches deep, streets must be made passable for commonly used emergency vehicles during runoff equivalent to a 25-year return frequency, except where an alternative access street not subject such ponding is available.
 - (vi) *Crawl spaces.* Crawl spaces must not pond water or be subject to prolonged dampness.
 - (vii) In all cases in which a Direct Endorsement (DE) mortgage submits to HUD for endorsement for insurance a mortgage on a newly constructed one- to four-family dwelling (including a newly erected manufactured home) which was processed by the DE mortgagee, the DE mortgagee shall determine whether the property is located in a 100-year floodplain as designated on maps of the Federal Emergency Management Agency and, if so, shall obtain a final Letter of Map Amendment (LOMA) or final Letter of Map Revision (LOMR) before submitting the application for

insurance to HUD. Such mortgages shall not be eligible for insurance unless the DE mortgagee submits the LOMA or LOMR to HUD with the mortgagee's request for endorsement.

(d) *Special construction and product acceptance—*

(1) *Structural features of factory produced (modular or panelized) housing components.*

- (i) For factory-fabricated systems or components, HUD Handbook 4950.1, "Technical Suitability of Products Programs Technical and Processing Procedures" shall apply.
- (ii) The requirements of this part shall apply to structural features, consisting of factory fabricated systems or components assemble either at the factory or at the construction site, if the total construction s covered by these standards and can be inspected on-site for determination of compliance.

(2) *Non-structural or non-standard features.* These features include methods of construction, systems, sub-systems, components, materials and processes that are not covered by these requirements. See HUD Handbook 4950.1 for procedures to be followed in order to obtain acceptance of non-structural components and materials. See HUD Handbook 4910.1, appendix F for a list of Use of Materials Bulletins. Products and methods shall conform to the appropriate Use of Materials Bulletin.

(3) *Standard Features.* These features include methods of construction, systems, sub-systems, components, materials and processes that are covered by national society or industry standards. For a list of standards and practices to which compliance is required, see HUD Handbook 4910.1, Appendix C, and Appendices E and F.

(e) *Energy efficiency.* All detached one- and two-family dwellings and one family townhouses not more than three stories in height shall comply with the CABO Model Energy Code, 1992 Edition, Residential Buildings, except for Sections 101.3.1, 101.3.2, 104, and 105, but Section 101.3.2.2, Historic Buildings, shall remain, and including the Appendix, and HUD intermediate MPS Supplement 4930.2 Solar Heating and Domestic Hot Water Systems, 1989 edition.

(e) *Water supply systems—*

(1) *General.*

- (i) Each living unit shall be provided with a continuing and sufficient supply of safe water under adequate pressure and of appropriate quality for all household uses. Newly constructed residential property for which a building permit has been applied for on or after June 19, 1988, from the competent authority with jurisdiction in this matter shall have lead-free water piping. For purposes of these standards, water piping is "lead-free" if it uses solders and flux containing not more than 0.2 percent lead and pipes and pipe fittings containing not more than 8.0 percent lead. This

- system shall not impair the function or durability of the plumbing system or attachments.
- (ii) The chemical or bacteriological standards of the health authority shall apply. In the absence of such standards, those of the appropriate State agency shall apply. Either the health authority or the HUD Field Office may require a water analysis.
 - (iii) Connection shall be made to a public water system.

C.5 HUD Supplemental information for use with Building Codes⁵

General design requirements, wind design, and earthquake design criteria shall be as specified in Chapter 23 of the Uniform Building Code, 1988 Edition as amended by the Tempe Building Code currently adopted and in effect at the time that the building permit is applied for.

C.6 HUD Incorporation by reference of minimum property standards⁶

The Minimum Property Standards as contained in the handbooks identified herein are incorporated by reference in this section as though set forth in full in accordance with 5 U. S. C. 552(a) and 1 CFR part 51.

C.7 Description and identification of minimum property standards⁷

(a) *Description.* The Minimum Property Standards describe physical standards for housing. They are intended to provide a sound basis for determining the accessibility of housing built under the HUD mortgage insurance and low-rent public housing programs. The City of Tempe Redevelopment Division has adopted these standards as the basis for the Tempe Housing Program Rehabilitation Standards. The Minimum Property Standards refer to material standards developed by industry and accepted by HUD. In addition, under Section 521 of the National Housing Act, HUD adopts its own technical suitability standards for materials and products for which there are no industry standards acceptable to HUD. These standards are contained in HUD Description and identification of minimum property standards (continued).

Use of Materials Bulletins that apply to products and methods and Materials Releases that apply to specific materials. Use of Materials Bulletins and Materials Releases are addenda to the Minimum Property Standards. Unless otherwise stated, the current edition, issue, or version of each of these documents, as available for its source, is applicable. A list of Use of Materials Bulletins, Materials Releases, and MPS Appendix listing the applicable referenced Standards may be obtained from the Construction Standards Division, Office of Manufactured Housing and Construction Standards, room 6170 Departments of Housing and Urban Development, 451 7th Street, SW, Washington, DC 20410.

- (b) *Identification.* The Minimum Property Standards have been published as described below:

- (1) MPS for One and Two Family Dwellings. See HUD Construction requirements contained in this part. This material is also at §§ 200.926, 200.926(a) through (e).
- (2) MPS for Housing –

C.8 HUD Building Products or Materials Certification Program⁸

The program under which building products or materials are validated and certified as meeting applicable HUD standards uses separate programs for each particular product or material for which HUD requires certification. The following list identifies the supplementary specific procedural requirements, building product standards, and certification requirements under which products and materials shall be designed, assembled and tested.

§ 200.936	Solid fuel type room heaters and fireplace stoves.
§ 200.937	Plastic bathtub units, plastic shower receptors and stalls, plastic lavatories, plastic water closet bowls and tanks.
§200.938	Aluminum fenestration products.
§200.939	Wood fenestration products.
§200.940	Sealed insulating glass units.
§200.941	Poly vinyl chloride PVC fenestration products.
§200.942	Carpet and carpet with attached cushion.
§200.943	Grademarking of lumber.
§200.944	Plywood and other performance rated wood based structural-use panels.
§200.945	Carpet.
§200.946	Exterior finish and insulation systems (Use of Materials Bulletin UM 101).
§200.947	Polystyrene foam insulation board.
§200.948	Carpet cushion.
§200.949	Insulated steel door systems.
§200.950	Solar water heating system.

Appendix D Technical Sections

- D.1** The following standards identify residential building code requirements that are specific to Tempe. The City of Tempe Building Safety Division amendments to the uniform requirements of adopted codes are cross-referenced in the categorical arrangement provided for in the HUD Minimum Property Standards.

The building code requirements of this section are unique to residential construction in Tempe and may not be familiar to contractors and trades people who have limited experience working here. The complete provisions of these code amendments are available at no cost from the City of Tempe, Development Services Department, Building Safety Division located at 31 E. 5th Street, Tempe, Arizona. Phone (480) 350-8341, TDD: (480) 350-8913.

Tempe has not adopted the Uniform Code for Building Conservation¹ or otherwise modified its' regulatory system of construction code application and enforcement with regard to residential rehabilitation. Never the less, we are encouraging building rehabilitation as a cost-effective means of maintaining and conserving affordable housing choice in Tempe. By making our older building stock safe, sound, and functional, we can significantly aid in achieving our goal of maintaining a housing inventory that is affordable for low to moderate income families² and preservation and revitalization of Tempe's older neighborhoods.

In addition to directing the reader's attention to Tempe's code amendments and modifications, this section provides identification of objectives and a general discussion of the intent of each area of the technical provisions. These comments are included to increase understanding of how the current regulatory system can be accommodated in the course of housing rehabilitation. By taking advantage of code provisions for "alternative methods" of achieving safety, the inventory of existing housing can be conserved and enhanced.

In subsequent sections of this document Tempe adopts rehabilitation guidelines in addition to the code requirements identified herein. As Congress intended, Rehabilitation Guidelines are not a code. The purpose of the guidelines is to provide a means to upgrade and preserve the built environment while maintaining reasonable standards for health and safety. The information contained in this section is intended to support the rehabilitation guidelines and to further out general view of exiting buildings as a resource to be conserved, rehabilitated, and reused.

- (a) The following information pertains to the City of Tempe Housing and Rehabilitation Program and does not apply to change in use or occupancy of buildings or non-residential structures. Chapter 34 of the Uniform Building Code as amended by the Tempe Building Code addresses additions, alterations, or repairs to existing buildings. In summary it states;
- (1) New work must conform to code.

- (2) Work shall not cause existing building to become unsafe or overloaded.
- (3) Altered buildings shall not exceed the height and area limits for new buildings.
- (4) Nonstructural work may be done with original materials.

Within these limitations, additions, alterations, and repairs may be made without bringing the existing structure up to new code requirements provided that additions, alterations, and repairs within a twelve (12) month period do not exceed fifty percent (50%) of the value of the existing building or structure.

- (b) A fundamental principal of rehabilitating existing buildings is that existing buildings, legally constructed at some time in the past, shall be considered acceptable today unless they do not conform to specific retroactive requirements. In all cases, this premise shall be applied with paramount consideration given to public safety.
- (c) This information shall be understood to encourage suggestion and acceptance of alternative solutions whenever compliance with new construction requirements is impracticable. If building systems have been maintained in good and safe condition and are working properly, they shall be deemed to have conformed to applicable law in place at the time of installation.

D.2 Fire Safety

The objective of these provisions is to assure a high degree of safety to life and property preservation, by the separation of living units and the use of materials which will retard the spread of fire and prevent the passage of flame, smoke, and hot gasses through open or concealed spaces within the building, and to provide means of egress which will permit persons to leave the building safely in an emergency, and permit access for fire control personnel.

These provisions apply to the rehabilitation construction of existing buildings. However, where the construction, plan arrangement, and number of occupants of a property are to remain unchanged, and the fire protection provisions of the Code are complied with, non-compliance with the provisions of this section may be acceptable, when determined by the Tempe Building Official.

Fire ratings change so rapidly that construction thirty or more years old is considered "archaic". Archaic materials and construction methods are not inherently inferior. A major difficulty in dealing with archaic materials is not their suitability, but rather familiarity. Standard time-temperature methods for fire resistance testing have changed little since the 1920's³. Other fire-related properties such as flame spread, smoke production, and degree of combustibility of archaic building materials can generally be assumed to fall within well-defined values because their principal combustible component is cellulose. If there is any doubt whether an archaic material has an appropriate fire resistance rating, appropriate values can be established by research, by calculation⁴, or as a last resort, by testing where feasible.

Over time changes in building technologies have occurred in response to economic or technological issues that are not necessarily related to concerns for safety. Platform-frame construction is thought to have replaced the older balloon-frame technique in response to lack of available long lumber. The difference remains significant because the platform system is automatically fire-blocked at each floor. By the time a building is ready for rehabilitation, many changes have occurred to the original structure. Accordingly, it is not sufficient to only consider the fire resistance of an assembly as originally constructed. Penetrations for pipes and wires that have occurred over time should be considered carefully. Evaluation of rehabilitation feasibly must consider the ease with which fire can spread in concealed spaces.

Thirty years ago process and quality controls varied widely in many industries and variations in locally available raw materials and manufacturing techniques often produced products with inconsistent strength and durability. Fortunately, when a building assembly or component is found to be deficient, the fire endurance can be upgraded by providing a protective membrane such as a new layer of brick, plaster, or drywall. The fire resistance of this membrane is called the "finish rating" and can be specifically determined from tables.

Reference: The Tempe Building Code consists of the Uniform Building Code (U.B.C.), 1994 Edition, and the City of Tempe Amendments to the 1994 U.B.C. contained in Section 8-300, Chapter 8 of the Tempe City Code.

- (1) Allowable height and area – note Tempe Building Code modification to the Uniform Building Code revising §:504.1 Single Floor Areas; 504.2 Areas of Multi Floor Buildings; 504.5 Basements; 506 Maximum Height of Buildings and Increases; 506 General.
- (2) Fire Separators – note Tempe Building Code modifications to the Uniform Building Code revising §: 504.6 Area separation walls; 310.2.2 Special provisions; 310.3 Location on property.
- (3) Fire Resistance Requirements – note Tempe Building Code modifications to the Uniform Building Code revising §: 503.2 Fire ratings for occupancy separations; 508 Fire resistive substitution; 606.3 Exterior walls; 703.1 General; 713 Fire resistive assemblies for protection of openings.
- (4) Egress Doors and Windows – note Tempe Building Code modifications to the Uniform Building Code revising §:1001.7 Entrances to buildings; 1003.5 Exits through adjoining rooms; 1004.3 Type of lock or latch; 1005.8.1 Doors.
- (5) Unit Smoke Detectors – note Tempe Building Code modifications to the Uniform Building Code revising §: 310.9.1.2 Additions, alterations or repairs to Group R Occupancies.
- (6) Flame Spread – note Tempe Building Code modifications to the Uniform Building Code revising §: 805 Textile wall coverings.

D.3 Light and Ventilation

The objective of these provisions is to assure a living unit, which provides for a healthful environment and complete living facilities arranged and equipped for suitable and desirable living conditions. For purposes of this section a healthful environment is one which provides an

acceptable degree of comfort within all rooms and hallways of the dwelling unit by having sufficient light and ventilation, and provided natural ventilation for structural spaces to minimize conditions conducive to decay and deterioration.

Natural light and ventilation are discussed in this part. Egress is discussed in part 9.1 and accident safety related to window glazing is discussed in part 9.12.

The Uniform Building Code requires habitable rooms to be provided with natural light from windows equal in area to ten percent (10%) of the floor area, and with natural ventilation from operable exterior openings (operable windows) equal in area to 5 percent of the floor area. Code permits mechanical ventilation in lieu of natural ventilation, however, in residential structures artificial light is not accepted as a substitute for natural light.

Because most existing buildings meet basic health and safety requirements, it is unlikely that these code requirements will be at issue during the residential rehabilitation process. However, rehabilitation should ensure that these requirements are not violated and that any existing violations are remedied during the process.

Please note that the Secretary of the Interior recognizes that windows are an extremely important element in the overall historic character of a building and should be retained and preserved in historic preservation work⁵.

Reference: The Tempe Building Code consists of the Uniform Building Code (U.B.C.), 1994 Edition, and the City of Tempe Amendments to the 1994 U.B.C. contained in Section 8-300, Chapter 8 of the Tempe Building Code.

- (1) Habitable Rooms – note Tempe Building Code modifications to the Uniform Building Code revising §: 1203 General.
- (2) Bath and Toilet Rooms – note Tempe Building Code modifications to the Uniform Building Code revising §: 1203 General.

D.4 Structural Loads and Seismic Design

The building code prescribes general design requirements applicable to all regulated structures and requires all buildings to be designed and constructed to sustain specified loads. Any system or method of construction to be used is required by code to be based on a rational analysis resulting in a system which provides a complete load path capable of transferring all loads and forces from their point of origin to the load-resisting elements.

Assessment of the condition of an existing building's structural system can be the key to determining the building's continued use or rehabilitation. While it may seem intuitive that a building that has withstood the combined service loads and environmental stresses from years of use has proved itself; the possibility of cumulative deleterious effects from these forces may not be apparent. The loads and stresses experienced by a building may be different from that foreseen at the time of design and construction or envisioned in the regulations under which it

was built. Seismic design is a relatively recent science and residential building constructed before the 1930's and 1940's generally did not consider these loads.

A structural assessment will in most cases adequately ascertain the existing condition of building safety. In addition, field and laboratory testing can further determine adequacy of existing structural elements. When a basic visual examination of the building indicates a patterned series of deficiencies, significant deterioration of structural elements, or other indications of structural problems, structural conditions assessment should be performed by a person experienced in structural inspection.

Reference: The Tempe Building Code consists of the Uniform Building Code (U.B.C.), 1994 Edition, and the City of Tempe Amendments to the 1994 U.B.C. contained in Section 8-300, Chapter 8 of the Tempe City Code.

- (1) Design Live Loads – note Tempe Building Code modifications to the Uniform Building Code revising §: 1603.3.5
- (2) Wind Loads – note Tempe Building Code modifications to the Uniform Building Code revising §: 1617 Exposure; 1614 Open buildings, structure, or story; 1626 Symbols and notations.
- (3) Earthquake Loads – note Tempe Building Code modifications to the Uniform Building Code revising §: 1627.1 Basis for design; 1627.2 Seismic zones; 1627.8.1 Selection of lateral force procedure; 1628.7.2 Overturning; 1628.9 P-delta effects; 1631.1 General; 1631.2.9(5) Diaphragms; TABLE 16-I Seismic Zone Factor Z; TABLE 16-O Structural Systems; TABLE 16-P Horizontal Force Factor.

D.5 Foundation Systems

The building code sets forth requirements for building foundations and prescribes materials and methods for design and construction of footings, foundations, excavations, and structural fills. Differential settlement is common in older buildings because soil bearing capacities and building foundation loads vary extensively. A small amount of settlement will be structurally significant only if long-term moisture can leak through resulting cracks and affect critical building components.

Large movements in contiguous structural elements such as floors and foundations and monolithic materials such as concrete usually result in cracks. Cracks are most likely to occur at corners and openings and will typically be diagonal. Significant structural problems related to large movements in structural elements include; fracture, loss of bearing, or over-stressing of joints and fasteners. Field observation of these conditions warrants a thorough structural conditions assessment performed by a person experienced in structural inspection.

Reference: The Tempe Building Code consists of the Uniform Building Code (U.B.C.), 1994 Edition, and the City of Tempe Amendments to the 1994 U.B.C. contained in Section 8-300, Chapter 8 of the Tempe City Code.

- (1) Foundation Depths – note Tempe Building Code modifications to the Uniform Building Code revising §: 1806.4.5 Foundation elevation.
- (2) Footings – note Tempe Building Code modifications to the Uniform Building Code revising §: TABLE 18-1-D Foundations for Stud Bearing Walls.
- (3) Foundation Materials Criteria – note Tempe Building Code modifications to the Uniform Building Code revising §: 1402.4 Dampproofing foundation walls.

D.6 Materials Standards

The objective of these provisions is to provide materials of such kind and quality as to assure that the dwelling will provide: (a) appropriate structural strength, (b) adequate resistance to weather and moisture, and (c) reasonable durability and economy of maintenance.

All materials and products used as replacements or additions in rehabilitation construction shall be of good quality conforming to generally accepted good practice. Recycled components, elements, and materials, which meet the standards for new materials, may be used when approved by the proper local authority. Proper authority shall determine the suitability of special materials and products not conforming to a national standard after an evaluation of properties and performance characteristics. The City is concerned with the on-going maintenance and operational characteristics of materials and methods used in the work of rehabilitation and will consider those installations which provide value over the installed life of the product to be most appropriate.

Reference: The Tempe Building Code consists of the Uniform Building Code (U.B.C.), 1994 Edition, and the City of Tempe Amendments to the 1994 U.B.C. contained in Section 8-300, Chapter 8 of the Tempe City Code.

- (1) Materials Standards – note Tempe Building Code adopts without amendment or modification the Uniform Building Code Standards 201.2.1.

D.7 Construction Components

The Uniform Building Code prescribes materials, design, construction, and quality control of building construction components in chapters dedicated to specific materials. Our purpose in this part is to consider components in the context of residential rehabilitation. The information contained here is intended to assist in the evaluation of the rehabilitation potential of exterior and interior building components by calling attention to patterns of symptoms that are indicators of the extent of rehabilitation required and the effect on potential cost of repairs.

Most residential buildings do not have inherent structural problems; however, we do not rehabilitate most residential buildings. Fortunately, many minor structural faults can be readily remedied through cost-effective rehabilitation practices. Major structural problems, when they do

occur, are usually obvious. Less obvious problems require careful inspection and a considered diagnosis for correction because they can significantly impact the project budget and may make rehabilitation unfeasible. This part identifies signs of structural distress and deterioration by material type. Further discussion of structural condition assessment is found in part 7.3 above.

Metal structural components found in residential buildings are usually limited to beams over long spans, angles over masonry openings, and pipe columns. These components are almost always made of steel. Problems with steel structural components are usually due to corrosion. Check lintels and other imbedded metal components for corrosion and determine their structural condition. Check columns for corrosion, adequate connections at base and top, and eccentric (off center) loading or tilting and determine their structural condition. Check beams for bearing, connections to the structure, and deflection. Inadequate bearing can result from differential settlement. Beams in small buildings rarely deflect, however, if found the cause should be determined and remedied. Check all metal components for fire damage, which can severely decrease load bearing capacity and usefulness.

Masonry found in residential buildings may be bearing or nonbearing exterior or interior walls, above or below ground foundations and piers, and chimneys. More modern masonry constructions designed and constructed in the past forty (40) to fifty (50) years took advantage of the increased compressive strength of units and mortars at the expense of the flexibility of the earlier, more massive, systems. Check all exposed masonry for cracking, spalling, bulging, bowing, leaning and mortar deterioration. Cracks should always be evaluated to determine their cause and treatment (if any). Check for mortar deterioration most often found in areas of excessive moisture. Repointing should only be done after the composition of the existing mortar has been tested, identified, and matched. Check for unit deterioration such as spalling, dusting, or flaking to determine if conditions result from mechanical or chemical damage. Consult a specialist for appropriate methods of treatment when these conditions are observed. Check stone, brick or concrete block foundations for problems associated with differential settlement, rotation, physical deterioration, loss of bearing, and bowing and determine their structural condition. Check above ground masonry for cracking or displacement and leaning. Check chimneys for differential settlement, deterioration near the top, and leaning. Although many masonry problems can be readily diagnosed and repaired, remember that a professional structural condition assessment should be performed if the apparent cause of deficient conditions is not obvious.

Concrete is commonly used for slab-on-grade floors, patios, carports, and driveways and may be used for footings and foundations and as precast lintels at masonry openings. Indications of concrete deterioration are usually limited. Concrete patching procedures will usually suffice when damage is not extensive. More extensive damage may require a detailed analysis of remaining structural capacity and again a professional structural condition assessment should be performed if the causal relationships are not apparent.

Wood components in residential buildings are commonly concealed by fixed floor, wall, and ceiling materials. Often attics and crawl spaces will provide the only opportunity for examination of wood structural components. Common indicators of problems with wood components are sloping or springy floors, wall and ceiling cracks, bulges, and sticking doors and windows, although many of these problems are often attributable to differential settlement of foundations.

When failures occur in wood components they usually involve individual wood members and rarely result in the failure of an entire system or structure. The most common problems with wood components are; deflection and warping, fungal and insect attack, and fire. Deflection and warping of wood components can generally be tolerated unless it causes loss of bearing or otherwise weakens connections, or opens watertight joints in critical locations. The moisture content in properly protected wood components usually stabilizes well below the limit required to promote attack by fungus and insects and, if these conditions are observed, proper treatment of the problem includes elimination of the moisture. The charred portion of wood damaged by fire has lost its structural strength; however, the remaining wood maintains its structural capacity in proportion to the size and strength of the reduced cross sectional area. Here again, major repairs necessitated by fire damage will require performing a professional structural condition assessment.

Roof construction that is weather tight is basic to the preservation of any structure. An energy efficient roof (or attic space) is equally basic to energy conservation within the home. The roof is a highly vulnerable system that will eventually fail. The roof surface materials, support systems, flashing assemblies, and substrate must all be evaluated together in determining the condition of the roof. Replacement of the complete system is normally appropriate in lieu of limited repairs, which would normally postpone the need for expensive maintenance to a point in time within the ten-year project horizon. It should be noted that the Tempe Building Code does not permit continued use of solid spaced sheathing as a substrate for the roof.

Heat gain from the roof plane is the single largest contributor to residential cooling load. Proper roof or attic ventilation and adequate insulation are effective energy conservation measures that should always be considered as part of roof replacement work due to their significant impact on the operational and maintenance costs of the home.

Reference: The Tempe Building Code consists of the Uniform Building Code (U.B.C.), 1994 Edition, and the City of Tempe Amendments to the 1994 U.B.C. contained in Section 8-300, Chapter 8 of the Tempe City Code.

- (1) Masonry – note Tempe Building Code modifications to the Uniform Building Code revising §: 2107.1.2 Allowable stresses in masonry; 2106 General Design Requirements; 2109.9 Unburned Clay Masonry.
- (2) Wood – note Tempe Building Code modifications to the Uniform Building Code revising §: 2317.5 Columns and posts; 2326.12.8 Blocking; 2326.9.2 Wood Structural Panels.
- (3) Roof Construction and Covering – note Tempe Building Code modifications to the Uniform Building Code revising §: 106.2 Item 12 Roof coverings; 2322.2 Structural roof sheathing; 2326.12.9 Roof sheathing; 1502 Definitions; 1503 Roof covering classification; 1504.4 Minimum Roof Classes; TABLE 15-A; TABLE 15-D-2 Clay or concrete roofing tile application; TABLE 15-B-2 Wood shingle or shake application.
- (4) Chimneys and Fireplaces – Note Tempe Building Code modifications to the Uniform Building Code revising §: 3102.3.7 Cleanouts; 3102.3.8 Spark Arrester; 3102.4.3 Reinforcing & Seismic Anchorage; 3102.7.14 Non-conforming fireplaces; Tempe City

D.8 Glass

Accident safety and energy conservation related to glass, glazing, and windows are discussed in this part. Egress is addressed in part 7.1, and natural light and ventilation is addressed in part 7.2. Windows on many historic homes are a major contributing element to the overall architectural character. They also frequently require maintenance and repairs. The state of glazing technologies today has advanced significantly. Safety, energy, and fire resistive capabilities have increased significantly in the last five (5) to ten (10) years. Substantial increases in performance are both available and affordable for residential rehabilitation.

The Uniform Building Code specifies materials, design, construction, and quality control of interior and exterior glass and glazing. Safety glass is designed to minimize cutting and piercing injuries when impacted by people. Fully tempered glass, laminated glass, and wired glass are recognized by the code as safety glazing materials. The code further identifies hazardous locations for glazing wherein susceptibility to impact is increased. Older residential buildings were not regulated by these requirements. Safety glazing is required to be identified by permanent labeling. Check glazing in framed and unframed swinging and sliding doors including storm doors. Check glazing in bath windows, doors and enclosures where the bottom edge is within sixty (60) inches above the standing surface or drain. Check glazing within a twenty four (24) inch arc of either vertical edge of the door in a closed position when the bottom edge is within sixty (60) inches of a walking surface. Check glazing greater than nine (9) square feet in area or, within eighteen (18) inches above the floor or, with top edge within thirty six (36) inches of the floor or, within thirty six (36) horizontal inches of a walking surface.

While code does not require replacement of intact existing glazing, however, note that the code takes exception to the replacement of materials "in-kind" provision for repair of glass by specifying that installation or replacement of glass shall be as for new construction.

Windows are a major source of heat loss and heat gain in residential structures. With the advent of low emissivity coatings, high-performance reflective coatings, and insulated units filled with gas or laminar films, the choice of materials and performance options can be overwhelming.

The first attempt to control heat loss through windows was to reduce air leakage around the perimeter of the units. This remains the most effective weatherization strategy today. Weather stripping operable sash and caulking fixed joints and cracks are a priority rehabilitation item.

As early as 1940, glass manufacturers introduced double pane insulating glass. Sealing a layer of air between two layers of glass significantly improved thermal performance and had the added benefit of reducing transmitted sound. In general, the thermal performance of any glazing can be described by two attributes: U-values and shading coefficient.

U-value describes the thermal conductivity of a material, or the amount of heat flow through a given thickness of material per degree of temperature difference. The U-value of a material is

related to thermal resistance (R-value) by the formula $U=1/R$, in other words conductivity is the inverse (or opposite) of resistance. For glazing, the lower the U-value (higher R-value) the better the performance.

Shading coefficient describes the amount of heat allowed to pass through glass. Solar energy can be absorbed, reflected, or transmitted into building interior. In our hot climate, residential glazing materials should have low shading coefficients, indicating less heat admitted through glazing. Heat absorbing glass, reflective glass, and Low-E glass all provide reduced shading coefficients. Heat absorbing glass is the oldest technology and like reflective products reduces the visible light admitted as well. Low-E glass is the newest technology and generally provides the most cost-effective balance of natural light and energy performance.

By combining double pane construction with low emissivity coatings (Low-E) the thermal performance of a window can be improved as much as five hundred percent (500%) while acoustic comfort is improved as well. The utility cost savings from reduced cooling and heating demand can quickly justify replacing existing windows in marginal condition with this improved technology.

Reference: The Tempe Building Code consists of the Uniform Building Code (U.B.C.), 1994 Edition, and the City of Tempe Amendments to the 1994 U.B.C. contained in Section 8-300, Chapter 8 of the Tempe City Code.

D.9 Mechanical

The objective of these provisions is to provide mechanical equipment for the building that will meet the needs of the intended occupants and be of a quality and condition which will assure; (a) operational safety, (b) adequate capacity for intended use, (c) protection from moisture, corrosion, or other destructive elements, (d) reasonable quiet and comfort, and (e) reasonable durability and economy of operation and maintenance.

All mechanical equipment shall be installed so that maintenance and replacement can be performed without the removal of other equipment or structure. Existing mechanical equipment and systems shall be inspected for faulty operation, fire safety or other hazards. Needed repair or replacement shall conform to the requirements for new construction.

Reference: The Tempe Mechanical Code consists of the Uniform Mechanical Code (U.M.C.), 1991 Edition, and the City of Tempe Amendments to the 1991 U.M.C. contained in Section 8-600, Chapter 8 of the Tempe City Code.

- (1) Heating, Cooling, and Ventilation Systems – note Tempe Mechanical Code modifications to the Uniform Mechanical Code revising §: 104(a) Additions, alterations and repairs; 201(e) Authority to disconnect; 201(f) Authority to condemn; 202 Unsafe mechanical systems and equipment; 305(b) Required inspections; TABLE 3-A Mechanical Permit Fees; 510(a) Condensate disposal; 710(h) Access; 1105(a) Exception; 1205 Condensate control; 1303 Access, inspection, and repair.

- (2) Gas, Liquid and Solid Fuel Piping and Equipment – note Tempe Mechanical Code modifications to the Uniform Plumbing Code revising §: 1202(g) Definitions; 1206(c) Inspections; 1213(b) and (e) Installation of gas piping.
- (3) Vents – note Tempe Mechanical Code modifications to the Uniform Mechanical Code revising §: 1104 Environmental air ducts; 1903(a) Moisture exhaust ducts; 1903(b) Length limitation.
- (4) Ventilation (Air Changes) – note Tempe Mechanical Code modification to the Uniform Mechanical Code revising §706(f) Prohibited sources; 1002(a) General.

D.10 Plumbing

The objective of these provisions is to provide a plumbing system for the building that will meet the needs of the intended occupants and be of a quality and condition which will assure; (a) operational safety, (b) adequate capacity for intended use, (c) protection from moisture, corrosion, or other destructive elements, (d) reasonable quiet and comfort, and (e) reasonable durability and economy of operation and maintenance.

The plumbing systems and appurtenances shall provide satisfactory water supply, drainage, venting and operation of fixtures. Plumbing systems including existing systems shall operate free from clogging and fouling, and not have cross connections which permit contamination of water supply or back-flow between fixtures. All existing private sewage disposal systems shall be disconnected and abandoned and connection made to the City sanitary sewer system when available. Household water supply shall be connected to the City water service.

Reference: The Tempe Building Code consists of the Uniform Plumbing Code (U.P.C), 1991 Edition, and the City of Tempe Amendments to the 1991 U.P.C. contained in Section 8-704, Chapter 8 of the Tempe City Code.

- (1) Materials Standards – note Tempe Plumbing Code modifications to the Uniform Plumbing Code revising §: 204 Lead; 401(a) Materials; 503(a) Materials; 1004(a) Materials; 1004(g) Materials; Appendix D1 – Materials.
- (2) Sizing and Installing Drainage Systems – note Tempe Plumbing Code modifications to the Uniform Plumbing Code revising §: 409(h) Drainage of fixtures below the next upstream manhole or below the main sewer level; Appendix D3.1.
- (3) Vents and Venting – note Tempe Plumbing Code modifications to the Uniform Plumbing Code revising §: 503(a)
- (4) Traps – note Tempe Plumbing Code modifications to the Uniform Plumbing Code revising §: 701(c) Traps required; 707 Trap seal protection.
- (5) Cleanouts – note Tempe Plumbing Code modifications to the Uniform Plumbing Code revising §: 406(a) and (c) Cleanouts.
- (6) Plumbing Fixtures – note Tempe Plumbing Code modifications to the Uniform Plumbing Code revising §: 907(e) Installation; 1801 Faucets; 1802 Scope; 1803 Water Closets; 1805 Shower heads; 1806 Faucets; 1807 Water conditioning systems; 1808 Evaporative coolers.

- (7) Water Supply and Distribution – note Tempe Plumbing Code modifications to the Uniform Plumbing Code revising §: 312 Installation standards; 318(b)3. Testing; 381(b)13. Test gauges; 802(d) and (l) Types of joints; 1003(b) and (r) Cross-connection control; 1007(c) and (e) Water pressure, pressure regulators, and pressure relief valves; 1008(b) Installation, inspection, and testing.
- (8) Sewage Disposal Systems – note Tempe Plumbing Code modifications to the Uniform Plumbing Code revising §: 318(b)5. Testing; 615(g) Combination waste and vent systems; 1106(a) Grade, support, and protection of building sewers; 1108 Sewer and water pipes; Appendix I –Private Sewage Disposal.

D.11 Electrical

The objective of these provisions is to provide minimum standards to safeguard life or limb, health, property and public welfare by regulating and controlling the design, construction, installation, quality of materials, location, operation, and maintenance or use of electrical systems and equipment.

The provisions of this article shall apply to the installation, alteration, repair, relocation, replacement, addition to, use or maintenance of electrical systems and equipment. A fundamental concept of the Tempe Redevelopment Program is to facilitate rehabilitation by permitting the maximum re-use of existing facilities. When this concept is applied to electrical facilities, inspection of existing physical and functional conditions must include determination of the load carrying capacity of the existing electrical installation by calculation in accordance with the current code.

Reference: The City of Tempe has adopted the 1996 Edition of the National Electrical Code, (NEC), with amendments. All provisions of this code and its amendments shall be cited as Sec. 8-404, Tempe City Code.

- (1) Divisions 1 and 2 – note Tempe Electrical Code Administrative Provisions to the Tempe Electrical Code as contained in Divisions 1 and 2 of Article IV, Chapter 8 of the Tempe City Code wherein Uniform Administrative Code Provisions for the National Electrical Code are adopted in accordance with NEC Section 8-404. Specific attention is directed to §:102(a) Additions, Alterations, and Repairs which provides for “the fifty percent rule”.
- (2) Branch circuits – note Tempe Electrical Code modifications to the National Electrical Code revising §: 210-5 Color Code for Branch Circuits; 220-3(c) Other Loads.
- (3) Services – note Tempe Electrical Code modifications to the National Electrical Code revising §: 110-33(a) Entrance; 230-28 Service Mast as Supports; 230-70(a) Location; 338-2 Uses permitted as Service-Entrance Conductors.
- (4) Grounding – note Tempe Electrical Code modifications to the National Electrical Code revising §: 350-14 Grounding; 351-9 Grounding; and 680-22(b) Common Bonding Grid.
- (5) Wiring methods – note Tempe Electrical Code modifications to the National Electrical Code revising §: 230-43 Wiring Methods for 600 Volts Nominal or Less, 305-3 Temporary wiring time constraints and 725-9 Bell or Signal Transformers.
- (6) Cable – note Tempe Electrical Code modifications to the National Electrical Code revising §: 110-7 Insulation Integrity; 336-3 Uses Permitted

- (7) Outlets, switches, and junction boxes – note Tempe Electrical Code modifications to the National Electrical Code revising §: 210-8(a) Dwelling units.
- (8) Panelboards – note Tempe Electrical Code modifications to the National Electrical Code revising §: 110-16(c) Panelboards.

Appendix E Rehabilitation Guidelines

- E.1** The following guidelines are intended to promote building conservation, rehabilitation, and reuse and to avoid a reduction of the existing housing stock and impediments to affordable housing choice in Tempe. These guidelines seek to mitigate the potentially detrimental effects of applying regulations intended for new construction to the residential rehabilitation program.

These guidelines are based on the HUD Minimum Property Standards specific requirements contained in the Handbooks cited below. These widely familiar requirements are used throughout the country for both Federally funded residential construction and private development.

- (1) Requirements for Existing Housing One to Four Family Living Units HUD Handbook 4905.1 REV-1 August 1991
- (2) Minimum Property Standards for Housing HUD Handbook 4910.1 1994 Edition

- E.2** General – At U.S. Code Chapter 69 – Community Development, Congress finds and declares that the future welfare of the Nation and the well-being of its citizens depend on the establishment and maintenance of viable urban communities as social, economic, and political entities, and require systematic and sustained action by Federal, State, and local governments to eliminate blight, to conserve and renew older urban areas, and to improve the living environment of low- and moderate-income families. To further the objective of restoration and limit the abandonment of existing housing resources; these provisions for rehabilitation construction of existing buildings under the CDBG/HOME programs shall apply.

E.3 General Use

- (a) As Congress intended, Rehabilitation Guidelines are not a code. The purpose of these guidelines is to provide a means to upgrade and preserve the built environment while maintaining reasonable standards for health and safety. The term “rehabilitation”, as used in these guidelines includes any set of activities related to the general view of existing buildings as a resource to be conserved, rehabilitated, or reused.
- (b) These guidelines are limited to the City of Tempe Housing Improvement Program and do not apply to change in use or occupancy of buildings or non-residential structures. Section 104 of the Uniform Building Code as amended by the Tempe Building Code addresses additions, alterations, or repairs to existing buildings. In summary it states;
 - (1) New work must conform to code.
 - (2) Work shall not cause existing buildings to become unsafe or overloaded.
 - (3) Altered buildings shall not exceed the height and area limits for new buildings.
 - (4) Non-structural work may be done with original materials.

Within these limitations, additions, alterations, and repairs may be made without bringing the existing structure up to new code requirements provided that additions, alterations,

and repairs within a 12 (twelve) month period do not exceed fifty percent of the value of the existing building or structure.

- (c) A fundamental principal of rehabilitating existing buildings is that existing buildings, legally constructed at some time in the past, shall be considered acceptable today unless they do not conform to a specific list of retroactive requirements. In all cases, this premise shall be applied with paramount consideration given to public safety.
- (d) These guidelines shall be understood to encourage suggestion and acceptance of alternative solutions whenever compliance with new construction requirements is impracticable. If building systems have been maintained in good and safe condition and are working properly, they shall be deemed to have conformed to applicable law in place at the time of installation.
- (e) These program requirements have evolved in response to frequently occurring conditions in Tempe and supplement, clarify, or expand HUD Minimum Property Standards, Code and Ordinance requirements. Note parenthetical numbers reference HUD Handbook 4910.1, Minimum Property Standards for Housing, 1994 Edition.

E.4 Sitework

- (a) Location on Property – Existing conditions as well as contemplated additions, alterations, and repairs shall be specifically located on the property with respect to established property lines, set-backs, rights-of-way, easements and other boundary lines as may exist at the location of work. Where the location of these features on the property is not sufficiently clear, a survey shall be obtained prior to commencing design or construction work.
- (b) Non-conforming Building, Uses, and Parking – A non-conforming building may not be reconstructed or structurally altered during its life to an extent exceeding fifty percent of the value of the existing building or structure without a Use Permit. A non-conforming use may be expanded or enlarged to an extent not exceeding twenty-five percent of the land area and/or building ground floor area by first obtaining a Use Permit. Tempe Redevelopment staff will assist with the coordination and processing of requests for Use Permits and Variances as required by the Zoning Ordinance.
- (c) Surface Drainage – Many Tempe properties are flood irrigated necessitating special consideration of site drainage conditions. Foundation walls shall extend at least 6 inches above the finished grade adjacent to the wall at all points. The grade away from foundation walls shall fall a minimum of 6 inches within the first 10 feet or greater as required for the control and drainage of surface water around buildings. Where lot lines, walls, slopes, or other physical barriers prohibit 6 inches of fall within 10 feet, drains or swales shall be provided to ensure drainage away from structure. Existing footings, which may be affected by any excavation, shall be protected against settlement and lateral movement.
- (d) Roads and Walks Drainage – adequate surface and underground drainage systems shall serve all paving and improvements so as to ensure continuing stable support for these improvements (602-2.2).
- (e) Termite decay protection – A chemical or physical barrier shall be provided for all structures. The City of Tempe has developed specifications for chemical soil treatment,

which provides an adequate barrier and serves as a minimum standard for method of treatment. Request a copy of these specifications from your Redevelopment Specialist as applicable.

E.5 Concrete

- (a) Slabs shall be designed and constructed in accordance with ACI 302.1R-80, Guide for Concrete Floor and Slab Construction, and as may be necessary to prevent damage due to potential soil movements (603-1.1).
- (b) Vapor retarders and base course shall be provided for all interior concrete slabs to which finished flooring is applied. Acceptable base course materials are gravel, slag, crushed rock, sand, cinders, and certain types of earth when approved by the local HUD Field Office. See ASTM C-33-90, Table 2. Base course material shall be cleaned, washed, and free from deleterious substances, consistent with ASTM C-33, with 100% passing a one inch sieve and less than 2% passing a #4 sieve (603-1.2).
- (c) Exterior Concrete Slabs-On-Grade – Slabs shall be designed and constructed in accordance with ACI 302.1R-80, Guide for Concrete Floor and Slab Construction, and as may be necessary to prevent slab damage due to potential soil movements (603-2).

E.6 Masonry (Reserved)

E.7 Metals (Reserved)

E.8 Wood & Plastics

- (a) The 1991 Edition of the National Design Specification for Wood Construction shall be used, including the 1991 supplement (606-3).

E.9 Thermal & Moisture Protection

- (a) Building Insulation – materials used for insulation shall be of proven effectiveness and adequate durability so as to ensure that the required design specifications concerning heat transmission, sound control, and fire rating are attained. Insulation in contact with the ground shall be installed so as not to be adversely affected by soil, vermin, and water (507-1).
- (b) Caulking and Joint Sealants – Materials used for caulking and sealants shall be suitable for the use intended, and shall be compatible with the materials to which they are applied and with any finish that may be applied over them (507-2).
- (c) Flashing – Flashing shall have a service life at least equal to that of the assemblies into which it is built.
 - 1. Alternate products or systems of bitumen-impregnated plastic or elastomeric materials may be used for flashing if they are installed in accordance with the manufacturer's recommendations and are acceptable to the HUD Field Office. Counter flashing is considered exposed flashing and shall be constructed of sheet metal.
 - 2. All openings between wood or metal and masonry shall be caulked with a non-hardening caulking compound.

- (d) **Energy Efficiency** – All buildings shall be constructed in compliance with the requirements of CABO Model Energy Code, 1992 Edition, except Sections 101.3 and 502.1.2, but including the Appendix. The values to be used for Table 302.1 are as follows:

Table 302.1 Exterior Design Conditions

Winter ¹	Design Dry-bulb	30° F
Summer ¹	Design Dry-bulb	105° F
	Design Wet-bulb	73° F
Degree days heating ² 1655		
For SI: °F. = 1.8° C. + 32		
¹ Outdoor design temperature selected to reflect local weather experience.		
² The Degree Days Heating are base 65° F.		

- (e) **Thermal mass** – In addition to the energy criteria set forth above, the design of a property may take into consideration the thermal mass of building components. However, thermal mass may be considered only to the extent that the builder can provide the HUD Field Office with empirical evidence that quantifies the effect of thermal mass with respect to the specific geographical location and the specific type of construction in question. When the quantifiable effects of thermal mass are considered, the building must provide a level of energy efficiency equal to or exceeding that otherwise required by these minimum property standards.
- (f) **Gutters (607-3.1):**

- Gutters shall be provided when either of the following conditions are present:
 - Soil is of such a nature that excessive erosion or expansion will occur or,
 - Roof overhangs are less than 12 inches in width for one-story structures or less than 24 inches in width for two story structures.
- When gutters are omitted, a diverter or other suitable means shall be provided to prevent water from draining on uncovered entrance platforms or steps.
- A gutter having approximately the same cross section as the downspouts shall be used for spacing of up to 40 feet between downspouts. For each additional 20 feet of gutter, the gutter width shall be increased by 1 inch.
- Strainers shall be installed at the head of the downspout when the downspout is connected to an underground drain.

5. Details of any built-in gutters shall be submitted to the HUD Field Office for acceptance.

- (g) Scuppers shall be installed for overflow of all roofs enclosed by parapet walls (607-3.2).
- (h) Downspouts shall be sized on the basis of 100 square feet of roof surface to 1 square inch of leader. More or less leader area may be required by the HUD Field Office (607-3.3).
- (i) Weather-stripping – All exterior doors shall have weather-stripping properly fitted so as to eliminate excessive infiltration of air. Windows and weather-stripping shall be properly fitted to eliminate infiltration of dust or rain.

E.10 Doors & Windows

- (a) Doors, Windows, Glazing Panels: Performance Testing – All windows and sliding glass doors shall be tested for air infiltration, water penetration, and physical loading in accordance with ASTM E 283-91, ASTM E 331-86, and ASTM E 330-90. The test unit shall be either the largest size marketed by the manufacturer or the size designated in the referenced standard. All windows and sliding glass doors shall meet or exceed the minimum performance levels set forth in the above referenced standards (508-1).
- (b) Steel Doors – Each interior and exterior steel door shall bear the manufacturer's certification that the product complies with the applicable standard. Each steel sliding glass door unit shall bear a label that identifies the manufacturer, certifies compliance with the tests required in (a) above, identifies the certifying organization, and states the maximum size of the unit tested (508-2.1).
- (c) Aluminum Doors – Each aluminum sliding glass door and aluminum storm door shall bear the label of an independent inspection agency. The label shall identify the manufacturer by name or symbol, and shall certify compliance with the applicable standard.
- (d) Wood Doors: Materials – Doors may be complete manufactured units or stock doors and frames. Job-built wood frames may be used. Entrance doors shall be of exterior type as defined in the applicable referenced standard and not less than 1 ¾ inch thick. Service doors (where temperature is near the same on both sides) may be 1- inch thick. Exterior doorframes shall be treated against decay. Interior hinged doors shall not be less than 1- inch thick. Closet doors may be 1- inch thick, provided that warp does not exceed ¼ inch (508-3.1).
- (e) Steel Windows – Steel windows shall bear a label that identifies the manufacturer, certifies compliance with the tests required in (a) above, identifies the certifying organization, and states the maximum size of unit tested (508-4.2).
- (f) Aluminum Windows – Aluminum windows shall bear the label of an independent testing agency. The label shall identify the manufacturer by name or symbol, and shall certify compliance with the applicable standard (508-4.3).
- (g) Operating Wood Windows – Operating windows shall be manufactured units consisting of the frame, sill, sash, weather stripping, and operating hardware. Job site assembled windows composed of frames and sashes made by different manufacturers are not acceptable. Each operating wood window unit shall bear the label of an independent inspection agency. The label shall identify the manufacturer by name or symbol, and shall certify compliance with the applicable standard (508-5.1).

- (h) Fixed Sash Windows – Fixed sash windows such as picture windows and bay windows, may be manufactured, job-built, or job-assembled units (508-5.2)
- (i) Hardware – Locks shall meet or exceed the performance criteria of ANSI A 156.2-89, for the series and grades as follows:
 - 1. Building entrance doors serving more than 2 families; series 4000, grade 1.
 - 2. Living unit entrance doors and building entrance doors serving one or two families; series 4000, grade 2.
 - 3. Doors within living units, series 4000, grade 3.

The performance criteria are contained in Sections 7, 8, and 9 of ANSI A 156.2-89. Evidence of conformance shall be provided to the HUD Field Office upon request. Three butt hinges shall be used on all exterior doors (508-6.1).

- (j) Locks shall be labeled as complying with the performance criteria of the applicable series and grade of ANSI A 156.2-89. The information shall appear on the lock, in the installation instructions, or on the packing box (508-6.2).
- (k) Each exterior doorway and each doorway leading to garage areas, common hallways, terraces, balconies, or other areas affording easy access to the premises shall be protected by a door which, if not a sliding door, shall be equipped with a deadlock using either an interlocking vertical bolt and striker, a minimum of 1.2 inch throw deadbolt, or a minimum ½ inch throw self-locking dead latch. Locks shall not require the use of a key for operation from the inside (401-1.2).
- (l) All sliding doors, first floor and basement windows and windows opening onto stairways, fire escapes, porches, terraces, balconies, or other areas affording easy access to the premises shall be equipped with a locking device. A sliding door used as a main or service entrance shall be equipped with a keyed locking device (401-1.2).
- (m) Screens shall be installed on openable windows in habitable rooms and bathrooms (608-3.3).

E.11 Finishes

- (a) Exterior Wall Finishes – (509-1).
 - 1. Each bundle of shingles or shakes shall bear a label identifying its grade and species, and certifying compliance with the applicable commercial standard.
 - 2. Each panel or package of hardboard shall bear a label identifying the specific type of hardboard and the manufacturer, and certifying compliance with the applicable standard.
 - 3. Hardboard products shall be manufactured in accordance with the standards listed at ANSI / AHA 135.6-90. Other hardboard products are considered special products and may be used in accordance with the procedures set forth below.
- (b) Finish Flooring, Rigid – (509-2).
 - 1. Each bundle or package of wood flooring shall bear a label identifying grade and species.
 - 2. Ceramic tile shall be identified as required by the applicable reference standard.

- (c) Finished Floor, Resilient – The thickness of resilient flooring may be less than required by reference standards, but no less than the thickness shown in Table 1, below.

TABLE 1
MINIMUM RESILIENT FLOORING THICKNESS

Material		Nominal Wear Layer Thickness (inches)	(2) Traffic Condition Where Material and Thickness are Acceptable			
			Smooth Tile		Embossed Tile	
			Through Pattern	Surface Pattern	Through Pattern	Surface Pattern
T I L E	Asphalt Tile	1/8 3/32	H M	L L	M L	L L
	Rubber Tile	1/8 5/64	H M	L L	M L	L L
	Vinyl Tile	0.08 0.05	H M	L L	M L	L L
	Vinyl Tile	1/8 1/16	H M	M L	M L	L L
S H E E T	Rotovinyl (3)	0.020 0.014 0.010	H M L			
	Vinyl Plastic (Backed) Sheet	0.050 0.030 0.020	H M L			
	Linoleum	0.090 0.050	H			
Notes: (1) Wear layer may be smooth, embossed, or otherwise textured.						
(2) H (heavy traffic) – public stairs, entrance corridors, lobbies, elevators. M (medium traffic) – stairs within living units and public areas except those designated under H above. L (light traffic) – areas within living units except stairs.						
(3) Floor covering with translucent or transparent vinyl surface with backing.						

- (d) Carpets and Mats – carpet cushions shall comply with the requirements of UM 72-80. Carpets shall comply with the requirements of UM 44C-78 (509-4).
- (i) Carpeting and cushioning shall be installed in accordance with the Specifiers Guide for Contract Carpet Installation, published by the Carpet and Rug Institute. The carpet shall be installed over one of the following suitable underlayments:
1. A finish floor as provided and described herein.
 2. A troweled concrete floor.
 3. A plywood subfloor. The top of plywood shall be at least “C plugged” grade.
 4. A plywood, hardboard, or particleboard underlayment over any other subfloor described in this paragraph.
 5. Other materials where they provide a smooth, hard, durable surface.
- (e) Paint Lead Content – No paint shall contain more than 0.06 percent lead by weight calculated as lead metal in the total nonvolatile content of liquid paints or in the dried film of paint already applied.
- (f) Paint Suitability – If a paint to be used on exterior surfaces is not inherently mold resistant, a suitable fungicide shall be included in the formulation.
- (g) Paint Application – Application of paints, stains, or other coating systems shall be in accordance with manufacturer’s directions. Additional costs may be required if the finish surface does not provide coverage or hiding that is acceptable to the HUD Filed Office (609-3).
- (h) Paint Schedule (609-3.2 et seq.) –
- (i) Wood Siding, Millwork, and Trim
- a. Knots, resinous wood, and nail holes shall be filled with putty and priming. Any nail holes and cracks in surfaces to be painted shall be filled with putty.
 - b. A prime coat shall be applied to all surfaces to be painted before or immediately after installation. Primer shall be formulated specifically for application to unfinished wood. Finish coats formulated to serve as primers may be used.
 - c. One of the following finish systems shall be applied:
 1. Oil Paint systems.
 2. Latex paint systems.
 3. Pigmented stains.
 4. Clear penetrating preservatives or water repellent finishing systems.
 - d. The top and bottom of wood doors, casement sash, awning sash, and the bottom of double hung sash shall receive two coats of finish.
 - e. Prior to erection, all edges of vertical siding shall be sealed with a heavy coat of house paint primer, water repellent stain, exterior

- house paint, or sealer. Wood batten strips shall be back-primed or sealed.
- (ii) Wood Shingles, Shakes, Roughsawn Siding
 - a. Two coats of oil stain, pigmented oil stain, or an oil shingle paint shall be applied.
 - (iii) Hardboard and Softwood Plywood Siding
 - a. These products shall be finished in accordance with the manufacturer's written instructions.
 - (iv) Unfinished Wood surfaces
 - a. Shingles and board siding of vertical grain cedar, redwood, and bald-cypress may be left unfinished.
2. Exterior Concrete Masonry Units or Concrete Block
- (i) At least two coats of masonry paint shall be applied.
 - (ii) Concrete masonry units or concrete block shall be painted to provide a water-resistant finish. High-density concrete brick or solid split block forming the outer face of double unit walls (veneer, cavity walls, ect.) may be left unpainted when acceptable to the HUD Field Office.
3. Exterior Metal
- (i) Galvanized Steel or Iron – Field painting shall consist of two coats. One coat shall be a primer specifically for galvanized surfaces, and the second coat shall be a finish coat. A finish coat formulated to serve as a primer may be used as the first coat.
 - (ii) Steel, Iron, or Terne Plate – Steel or iron, except stainless steel, weathering steels, or steel treated with coatings to provide corrosion resistance, shall be painted. A rust inhibitive primer and finish coat shall be applied.
4. Interior Wood Surfaces
- (i) Millwork and Trim – All millwork and trim, including windows; interior doors; window, door, and base trim; paneling and closet shelving and trim shall be finished by painting or natural finishing.
 - 1. Painting – If the surface is open grain wood, it shall be filled or sealed to prevent the grain from rising. One or more finish coats shall be applied to provide a smooth surface and good hiding.
 - 2. Natural Finishes – Natural finished includes stain-wax, stain followed by one or more coats of varnish, clear coats or varnish with or without wiped paint undercoats, or oil or wax finishes.
 - (ii) Wood Floors – If flooring is open grain wood, one coat of filler shall be applied. All excess shall be wiped off.
 - 1. Flooring shall be finished with one of the following:
 - a. One or two coats of penetrating sealer and one coat of wax;

- b. Two coats of varnish and one coat of wax;
 - c. Two coats of polyurethane;
 - d. One or more coats of factory applied finish.
- 5. Interior Plaster or Gypsum – Walls and Ceilings
 - (i) Plaster surfaces may be painted, covered, or left unfinished, except for surfaces of kitchens and baths. If painted, a finish coat shall be applied over a primer-sealer, unless finish coats are of the self-priming type.
 - (ii) Gypsum wallboard shall be covered. If painted, one coat of wallboard sealer shall be applied unless finished coats are of the self-sealing type. Two finish coats shall be applied over the sealer. One finish coat except in kitchens and baths may be acceptable if good coverage is obtained.
- 6. Interior Metal – Non-ferrous metals or wrought iron may be painted or left unfinished. Other metals shall be painted in accordance with requirements for exterior metal.
- 7. Interior Concrete Floors
 - (i) If painted, at least two coats of resin emulsion paint, solvent rubber paint, or a floor and deck enamel shall be applied. If oil paint is used, the surface shall be neutralized before painting.
 - (ii) A coat of wax shall be applied over paint, stain, or integral finish.
- 8. Wall Coverings – Covering material shall be secured to a suitable base in accordance with the manufacturer's directions.
- (i) Shower compartment floors and walls shall be finished with a wear resistant and non-absorbent surface to a height of not less than 6 feet above the floor (401-2.2).3

E.12 Specialties (Reserved)

E.13 Equipment

- (a) All manufactured factory finished cabinets shall comply with ANSI A 161.1-86, Recommended Minimum Construction and Performance for Kitchens and Vanity Cabinets, or with an equivalent standard. All cabinets shall bear the label of an independent agency that maintains continuous control over the testing and inspection of the cabinet. The label shall identify the manufacturer's name or symbol and indicate compliance with the applicable standards (611-1.1).
- (b) Construction and installation of job and custom-built cabinets shall be acceptable to the HUD Field Office. These cabinets shall be equivalent in quality and construction to cabinets meeting ANSI A 161.1-86.
- (c) Counter Tops shall be securely bonded to a reinforced steel core, to inch plywood, or to any other equivalent material.
 - (i) Top material shall be phenolic laminate, vinyl plastic covering, ceramic tile, stainless steel, or other material suitable for its intended use. At least a 3-inch back and end splash shall be provided against all abutting surfaces, which are not

water and grease resistant. When a back splash is omitted, the joints at the juncture of the counter top and vertical surfaces shall be tight and sealed.

- (ii) All edges, including the sink and any built-in surface units, shall have a non-corrodible metal molding or other suitable edging.

E.14 Furnishings (Reserved)

E.15 Special Construction

- (a) Special or alternate construction materials and products are those which are new or are not covered by specific requirements in these standards or in the referenced standards contained in Section 6, HUD Minimum Property Standards. Special or alternate materials and products may be used as prescribed in HUD Handbook 4950.1 Technical Suitability of Products program, Technical and Processing Procedures (513).

E.16 Conveying (Reserved)

E.17 Mechanical (Reserved)

E.18 Electrical (Reserved)

Appendix F Rehabilitation Guidelines Applications & Interpretations

This section provides an illustrated review of code issues frequently misunderstood or omitted in the process of residential rehabilitation. Code requirements are explained to provide an understanding of commonly misinterpreted issues. The purpose of this is to assist program participants in the application and interpretation of the code and ordinance requirements governing construction in Tempe. This section does not modify or alter code and ordinance requirements governing construction in Tempe.

Section F.1 Access and Exit Facilities and Emergency Escapes – UBC 310

- (a) Requirements for emergency escape or rescue have been determined to provide for rescue effected from the exterior of the building or, alternatively, to facilitate escape to the exterior of the building without the need to travel through the building itself. For this reason, emergency travel must ultimately lead a public way.
- (b) All minimum dimensions specified for required rescue windows including net clear area are based on requirements to admit a firefighter with full rescue equipment.

310.4 Basements in dwelling units and every sleeping room below the fourth story shall have at least one operable window or door approved for emergency escape or rescue which shall open directly into a public street, public alley, yard, or exit court. The units shall be operable from the inside to provide a full clear opening without the use of separate tools.

All escape or rescue windows shall have a minimum net clear openable area of 5.7 square feet. The minimum net clear openable height dimension shall be 24 inches. The minimum net clear openable width shall be 20 inches. When windows are provided as a means of escape or rescue they shall have a finished sill height not more than 44 inches above the floor.

Bars, grills, grates or similar devices may be installed on emergency escape or rescue windows or doors, provided:

1. The devices are equipped with approved release mechanisms which are openable from the inside without the use of a key or special knowledge or effort; and
2. The building is equipped with smoke detectors installed in accordance with Section 310.9.1.

Section F.2 Light and Ventilation – UBC 310.5 & 1203

- (a) The code does not recognize artificial light as a substitute for natural light. In the case of ventilation, the code will except a mechanical system using at least 20 percent outside air as a substitute for natural ventilation.
- (b) In cases where adjacent rooms join with unobstructed openings, light and ventilation requirements can be aggregated and spaces combined for determination of minimum areas.

Light, Ventilation, and Sanitation

Section 1203.1 General. For the purposes of determining the light or ventilation required by this section, any room may be considered as a portion of an adjoining room when one half of the area of the common wall is open and unobstructed and provides an opening of not less than one tenth of the floor area of the interior room or 25 square feet, whichever is greater.

Exterior openings for natural light or ventilation is required by this section shall open directly onto a public way or yard or court located on the same lot as the building.

Exceptions: 1. Required windows may open into a roofed porch where the porch:

- A. Abuts a public way, yard or court; and

- B. Has a ceiling height of not less than 7 feet; and
 - C. Has a longer side at least 65 percent open and unobstructed.
2. Skylights.

Section 1203.2 Light. Guest rooms and habitable rooms within a dwelling unit or congregate residence shall be provided with natural light by means of exterior glazed openings with an area not less than one tenth of the floor area of such rooms with a minimum of 10 square feet.

Section 1203.3 Ventilation. Guest rooms and habitable rooms within a dwelling unit or congregate residence shall be provided with natural light by means of openable exterior openings with an area of not less than one twentieth of the floor area of such room with a minimum of 5 square feet.

In lieu of required exterior openings for natural ventilating system may be provided. Such system shall be capable of providing two air changes per hour in all guest rooms, dormitories, habitable rooms and in public corridors. One fifth of the air supply shall be taken from the outside.

Section F.3 Shear Wall Hold-Downs Not Installed Correctly – UBC 1603.3.5

- (a) A shear wall is a wall designed to resist lateral forces parallel to the plane of the wall (sometimes referred to as a vertical diaphragm). Lateral forces such as wind and seismic loading produce a combination of overturning, sliding, and uplifting forces on a building. Shear walls are designed and used to resolve the combining effects of lateral forces ultimately to the ground by way of the building foundation.
- (b) Lateral forces acting on a shear wall produce tension at the end of the wall closest to the applied force (where the effect is to lift the wall up from its attachment to the foundation). The weight of the structure resists this upward force. Connections must be strong enough to keep all elements of the building together with these forces are acting. Tie-downs, straps, hold-downs and other tension-anchorage devices have been called out at specific locations on the drawings for this purpose.

1603.3.5 Anchorage. Anchorage of the roof to walls and columns and of walls and columns to foundations, shall be provided to resist the uplift and sliding forces which result from the application of the prescribed forces. For additional requirements for masonry and concrete walls, see Section 1611.

Section F.4 Metal Plate Connectors – UBC 2311.6

- (a) Section 2311.6 of the UBC requires that all truss manufacturers retain an approved agency having no financial interest in the plane being inspected to make nonscheduled inspections of truss fabrication and delivery operations.
- (b) Section 2343.6 requires all trusses to be legibly branded, marked, or otherwise have permanently fixed thereto the following information:
 - 1. Identify of the company manufacturing the truss.
 - 2. The design load.
 - 3. The spacing of trusses.
- (c) Please be reminded the Tempe Building Safety requires truss-engineering drawings to be submitted prior to construction permitting.

2311.6 Metal Plate Connectors. The material and workmanship during fabrication and the design of metal plate connectors employed as joint connectors for light wood trusses shall conform with the requirements of Division III. Each truss manufacturer shall retain an approved agency having no financial interest in the

plant being inspected to make nonscheduled inspections of truss fabrication and delivery and operations. The inspection shall cover all phases of truss operation, including lumber storage, handling, cutting, fixtures, presses or rollers, fabrication, bundling and banding, handling and delivery.

Section F.5 Shear Wall Nailing Not Per Plan – UBC 2314.1

- (a) A shear wall is a wall designed to resist lateral forces parallel to the plane of the wall (sometimes referred to as a vertical diaphragm). Lateral forces such as wind and seismic loads produce a combination of overturning, sliding and uplifting forces on a building. Shear walls are designed and used to resolve to combine effects of lateral forces ultimately to the ground by way of the building foundation.
- (b) When plans and specifications call out special nailing requirements for decking, sheathing, or panel products, the design calculations are probably based on requirements to resist shear. The calculated total force acting on the wall is distributed to each element of the wall system proportionately. The nailing schedule has been calculated in consideration of nail strength and panel shear values to ensure those capacities of single elements are not exceeded and those systems will function collectively.

Section 2314.1 General. Lumber, plywood and particle board diaphragms may be used to resist horizontal forces in horizontal and vertical distributing or resisting elements, provided the deflection in the plane of the diaphragm, as determined by calculations, tests, or analogies drawn therefrom, does not exceed the permissible deflection of attached distributing or resisting elements. See UBC Standard No. 23-2 for a method of calculating the deflection of a blocked plywood diaphragm.

Permissible deflection shall be that deflection up to which the diaphragm and any attached distributing or resisting element will maintain its structural integrity under assumed loads without danger to occupants of structure.

Connections and anchorages capable of resisting the design forces shall be provided between the diaphragms and the resisting elements. Openings in diaphragms, which materially affect their strength, shall be fully detailed on the plans and shall have their edges adequately, reinforced to transfer all shearing stresses.

Size and shape of diaphragms shall be limited as set forth in Table No. 23-I-I.

...Diaphragms sheathing nails or other approved connectors shall be driven flush but shall not fracture the surface of the sheathing.

Section F.6 Fire Blocks and Draft Stops – UBC 708

- (a) Fireblocking and draftstopping provided improved fire safety in wood-frame buildings. Fireblocking prevents movement of flame and gasses to other areas of a building through relatively small-concealed passages in building components such as floors, walls, and stairs.
- (b) Whatever materials are used, it is important to maintain the integrity of all fireblocking.

708.1 General. In combustible construction, fireblocking and draftstopping shall be installed to cut off all concealed draft openings (both vertical and horizontal) and shall form an effective barrier between floors, between a top story and a roof spaces, and floor-ceiling assemblies. The integrity of all fire blocks and draft stops shall be maintained.

708.2.1 Fire blocks, where required. Fire blocking shall be provided in the following locations:

1. In concealed spaces of stud walls and partitions, including furred spaces, at the ceiling and floor levels, and at 10-foot intervals both vertical and horizontal. See also Section 803, Item 1.
Exception: Fire blocks may be omitted at floor and ceiling levels when approved smoke-actuated fire dampers are installed at these levels.
2. At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings, and cove ceilings.

3. In concealed spaces between stair stringers at the top and bottom of the run and between studs along and in line with the run of stairs if the walls under the stairs are unfinished.
4. In openings around vents, pipes, ducts, chimneys, fireplaces, and similar openings, which afford a passage for fire at ceiling and floor levels, with non-combustible materials.
5. At openings between spaces and chimney chases for factory-built chimneys.

708.2.2 Fire block construction.

City of Tempe
P. O. Box 5002
21 East Sixth Street, #214
Tempe, AZ 85280
480-350-8950; (TDD:480-350-8913)



FAX:480-350-8902
Development Services Department
Housing Services Division

RE: Notice to Proceed

Dear Mr.:

Pursuant to the provisions of the contract entered into on date, between yourself, and **Homeowner** you are hereby given this "Notice to Proceed" with the rehabilitation of the property located at: Property Address.

In accordance with Section 4 of the Rehabilitation Contract, you must begin actual performance of work within five (5) calendar days from the date of this Notice, by date. The rehabilitation work on the above property shall be completed within 60 calendar days from the date of this Notice, by date. In the event you are unable to begin or complete the work by the deadlines indicated above, please contact the Grants Specialist listed below.

Under no circumstances will there be any deviation from the Contract and/or Scope of Work by any party without proper execution of a **Change Order** approved by the Homeowner and the City of Tempe as required under Section 7 of the Contract.

In addition, in accordance with Section 14 of the Rehabilitation Contract, you must submit copies of all applicable building permits and licenses required for the rehabilitation work performed on the above address. **Please be advised that failure to obtain the necessary permits is a violation of Tempe City Code.**

If you have any questions or concerns during the term of your Contract, please contact Housing Grants Specialist, at 480-350-8950 (TDD: 480-350-8913).

Sincerely,

Liz Chavez
Housing Services Supervisor

Exhibit A

HOUSING IMPROVEMENT CONTRACT ADDENDUM

Between Homeowner & Contractor

This AGREEMENT made and entered into this _____ day of **January, 2003**, by and between

Business Name (Contractor) _____

Hereinafter referred to as the CONTRACTOR, and

Homeowner Full Name _____

Hereinafter referred to as the OWNER(S).

WITNESSETH

The OWNER(S) desire(s) to engage the CONTRACTOR to perform certain work on the premises located at: **Street Number and Name Here Tempe, Arizona** _____.

The OWNER(S) desire(s) to rehabilitate the aforesaid premises in accordance with the City of Tempe's Housing Improvement Program.

This Contract is agreed upon in the amount of:

Rehabilitation Amount: _____

Homeowner Contribution: N/A

LBP Hazard Grant Amount: N/A

Total Contract Amount: _____

The parties do mutually agree as follows:

Addendum to Contract: This Housing Improvement Contract contains the entire agreement between the Owner(s) and the Contractor.

- OWNER contribution to construction cost, payable directly to CONTRACTOR once all work has been completed and inspected (refer to Section 13 of the Housing Improvement Contract).
- Additional grant amount listed above for Lead Based Paint Hazard Controls, payable to the CONTRACTOR once clearance test reports and an invoice are furnished to the City of Tempe (refer to Sections 9 and 10 of the Housing Improvement Contract).

If Lead Based Paint Hazard Controls are necessary, the Time for Performance (Section 4 of the Housing Improvement Contract) will be extended to accommodate this additional work. An additional 45 Calendar days will be granted to the CONTRACTOR. Requests for time extensions must be submitted in writing on company letterhead to the City of Tempe .

The CONTRACTOR shall also comply with the Lead Hazard Control Specifications when performing this work and will comply with all Federal, State and City regulations and safe work practices.

IN WITNESS WHEREOF, the OWNER(S) and CONTRACTOR have executed this Addendum to Contract as of the date on Page one of this Contract.

SIGNATURES:

Homeowner(s):

Homeowner Signature

Date

Homeowner Signature

Date

Homeowner Signature

Date

Witness

Date

Contractor:

Contractor Signature

Date

Contractor License Number

Witness

Date

Exhibit B

City of Tempe
P. O. Box 5002
21 East Sixth Street, #214
Tempe, AZ 85280
480-350-8950, TDD: 480-350-8913, FAX: 480-350-8902
Development Services Department
Housing Services Division



CONTRACTOR PAYMENT REQUEST

(Original Signatures Required; Faxes NOT Accepted)

I. Contractor Certification

Date: _____ Payment Request

Number: _____ of _____

Tax ID #: _____

Contractor: _____

Mailing Address: _____

Homeowner: _____

Homeowner Address: _____

City of Tempe Contract (include contingency) \$ _____

Change order/DATE _____ \$ _____

Previously Paid: \$ _____

Amount of this Request: \$ _____

Balance of Contract: \$ _____

For Completion of Items (Use Item Numbers and Descriptions on Scope of Work):

I hereby request an inspection of the above property to receive payment per the Rehabilitation Contract. My signature below certifies that I have satisfactorily completed the necessary work to justify this request and that all bills incurred for labor and materials in making said repairs and improvements have been paid in full to this date. I also certify

that all permits required for this project have been obtained and a final approval copy will be forwarded to the City of Tempe Housing Services.

Contractor's Signature

Date

II. Homeowner Certification:

I/We hereby certify that the work stated by the contractor above has been completed. My/Our signature below approves payment to the Contractor in accordance with our Rehabilitation Contract and is contingent upon inspection by the City of Tempe. It is understood that the actual amount disbursed to the Contractor will be based upon the findings of the inspection. I/We certify that all work has been completed to my/our satisfaction.

Homeowner's Signature – Head of Household

Date

Homeowner's Signature – Spouse/Co-Head of Household

Date

III. City of Tempe Certification:

I certify that the above property was inspected on: _____. I certify that all the work has been completed per the specifications of the Contractor's approved proposal and contract. I hereby approve payment in the amount requested above.

Housing Grants Specialist's Signature

Date

Office Use Only

Payment Type: ☐ **Grant Only** ☐ **Grant with/or Loan** ☐ **Final**
Payment Request

Approved

By: _____

Vendor Info:
attached

Vendor # _____

☐ W-9

L:\FORMS\Contractor Payment Request
01/17/03

Exhibit C

WHEN RECORDED MAIL TO:

City of Tempe
Attn: Terri Amabisca
Housing Services Division
PO Box 5002
Tempe, AZ 85280

SPACE ABOVE THIS LINE FOR

RECORDERS USE

NOTICE OF COMPLETION

NOTICE IS HEREBY GIVEN THAT:

1. The undersigned is the owner of the interest or estate stated below in the property hereinafter described.
2. The full name of the undersigned is: _____
3. The full address of the undersigned is: _____
(NUMBER AND STREET, CITY, STATE, ZIP)
4. The nature of the title of the undersigned is: Owner in Fee.
(e.g., owner in fee OR vendee under contract of purchase OR lessee OR OTHER APPROPRIATE DESIGNATION)
5. The full names and full address of all persons, if any, who hold title with the undersigned as joint tenants in common are:

Names	Addresses
none	none
6. The names of the predecessors in interest of the undersigned, if the property was transferred subsequent to the commencement of the work of improvement herein referred to are (OR IF NO TRANSFER WAS MADE, INSERT THE WORD "none")

Names	Addresses
none	none
7. A work of improvement on the property hereinafter described as completed on: _____ (Date)
8. The name of the original contractor, if any, for the work of improvement was: _____
(IF NO CONTRACTOR FOR THE WORK OF IMPROVEMENT AS A WHOLE, INSERT THE WORD "none").
IF NOTICE COVERS COMPLETION OF CONTRACT FOR ONLY PART OF THE WORK OF IMPROVEMENT, ADD: The kind of work done or material furnished was Gen. Rehab Repairs. (Give General Statement, e.g., furnishing of concrete for sidewalks).

Rehab. Repairs:
9. The property on which the work of improvement was completed is in the City of Tempe, County of Maricopa, State of Arizona, and is described as follows:

10. The street address of said property is: _____
(Number and Street, or, if there is no official street address, insert the word "none")

Dated: _____, 20____ (Signature)

(Signature)

VERIFICATION

I, the undersigned, say:

I am the person who signed the foregoing notice. I have read the above notice and know its contents, and the facts stated therein are true of my own knowledge.

I declare under penalty of perjury that the foregoing is true and correct.

(Signature)

State of Arizona)
before me)
by)
County of Maricopa)

Subscribed and sworn to (or affirmed)

this ____ day of _____, 2003

Name of Signer

l.s.

Signature of Notary Public

Exhibit D



The City of Tempe does not, in the provision of services, or in any manner, discriminate on the basis of race, color, national origin, religion, and sex family status or disability.

References

-
- ¹ §200.926 Minimum property standards for one and two family dwellings
² §200.926a Residential building code comparison items.
³ §200.296b Model codes.
⁴ §200.926d Construction requirements
⁵ §200.926e Supplemental information for use with the CABO One and Two Family Dwelling Code.
⁶ §200.927 Incorporation by reference of minimum property standards.
⁷ §200.929 Description and identification of minimum property standards.
⁸ §200.931 Statement of Availability.